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FOUNDED IN 1869 BY

DR. HERMAN KNAPP

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BY

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ARCHIVES OF OPHTHALMOLOGY.

REPORT OF ONE HUNDRED SUCCESSIVE EXTRACTIONS OF CATARACT IN THE CAPSULE AFTER SUBLUXATION WITH THE CAPSULE FORCEPS.[1]

BY ARNOLD KNAPP, M.D., NEW YORK CITY.

AFTER my visit to Colonel Smith in India, where I had the privilege of extracting cataracts in the capsule under his guidance, I attempted this operation here in New York, but failed to dislocate the lens by external manipulation without subjecting the eye to greater pressure than seemed wise. I therefore abandoned this method and returned to the old capsulotomy operation with the capsule forceps.

Dr. C. B. Meding, of New York, drew my attention to the Kalt capsule forceps, the extremities of which are flattened, cup-shaped, and without teeth. As these forceps are blunt, they have, according to Kalt,[2] the great advantage of not tearing the capsule at the place of application but at the circumference of the lens, so that most of the anterior capsule is removed. In using this forceps I found that in many cases the grip obtained on the capsule was so firm that after some manipulation the cataract became subluxated, whereupon it could be extracted in the capsule with very slight external manipulation and very little trauma to the eye. In the cases where the capsule tore after applying the forceps before subluxation had taken place, a large piece of the anterior capsule was always obtained, and the operation was then no different from the old one.

[1] A report on ninety-four of these cases operated on after this method was presented at the meeting of the Am. Ophth. Soc. at Hot Springs, Va., May, 1914.

[2] Soc. d'ophtalmol., Paris, 1909.

Since February 9, 1910, I have performed one hundred extractions of cataract in the capsule, after preliminary subluxation according to this method, and I now wish to report upon these successive cases in full.

DESCRIPTION OF OPERATION: After the usual preparation and the instillation of one drop of atropin, under holocain anæsthesia, the Koster speculum is introduced and left in place until the operation is completed, unless there is danger of or actual prolapse of vitreous. An assistant is necessary only in the presence of complications. The section must be large and should be just short of half the corneal circumference with a conjunctival flap. After the iridectomy, the capsule forceps is introduced to a point below the center of the pupil, the branches are then allowed to broadly separate, and a distinct knuckle of capsule is grasped. The grasp should not be too tight lest the capsule be torn, but sufficiently firm to exert traction on the periphery of the lens capsule. The closed branches of the forceps are gently moved from side to side, up and down, or rotated, and the capsule can be seen to follow in the various directions. When the dislocation has succeeded, a part of the margin of the cataract in the capsule appears free in the pupillary space. The portion dislocated is usually below, generally slightly to one side or the other, with the upper attachment unruptured. The forceps is then released and withdrawn. Pressure is exerted straight back on the lower part of the cornea with Smith's hook, and the cataract can be seen to turn a somersault; it "tumbles," in other words, as Smith calls it, and is delivered feet first. When the entire lens has been delivered, it will be found adherent above, where it is finally separated by a lateral stroking motion. In some cases the head presents first; the delivery is then slower and counterpressure must be applied at the scleral margin. The iris columns are then carefully replaced. The coloboma should ultimately not appear any different from that after an ordinary extraction.

Owing to the size of the lens in its capsule, and the necessary rupture of its suspensory attachment, the columns are apt to become wedged into the iris angle and are extricated with more trouble than usual. The conjunctival flap is replaced and the speculum removed. Atropin ointment is

introduced into the conjunctival sac and a dry dressing is applied. Both eyes are bandaged and the dressing is not changed for four days, unless some complication is feared. The unoperated-on eye is then left open and the patient is allowed up. The treatment of vitreous prolapse is the same as in the ordinary operation. If the capsule ruptures during the expression of the lens it can generally be easily grasped and drawn out with the blunt capsule forceps, after the contents have been expelled. There is practically no after-treatment. There may be some deep opacity of the cornea, especially if the lens is very large and the incision small, but this disappears after a few days.

SUCCESSIVE LIST OF CASES

NO.	NAME	AGE	CONDITION OF LENS	VITREOUS OR COMPLICATIONS	HEALING	FINAL RESULT
1	Gilligan.....	51	Mature.	..	..	$\frac{20}{15}$
2	Davenport....	82	Hypermature.	..	..	$\frac{10}{200}$ Dystrophia corn. epith.
3	Fredericks....	67	Hypermature.	..	Vomited; hemorrhage in vitreous and retina.	$\frac{20}{40}$ Opac. vitr.
4	Held.....	82	Hypermature.	..	..	$\frac{15}{200}$ Central choroidal changes.
5	Hagenman....	68	Mature.	+ Before extraction; loop used.	..	$\frac{20}{40}$ Opac. vitr.
6	Scheffmeyer...	76	Mature.	+ Before extraction; loop used.	Cyclitis.	$\frac{20}{40}$
7	Ruzeck.....	58	Mature.	..	Iris prolapse.	$\frac{20}{20}$
8	Goldman.....	61	Mature.	..	..	$\frac{20}{40}$ Old mac. corneæ.
9	Gibson.....	66	Mature.	..	Hyphema.	$\frac{20}{15}$
10	Pia.....	69	Mature.	..	Cyclitis.	$\frac{20}{20}$
11	Oltman.....	68	Mature.	Section down; old iridectomy.	..	$\frac{20}{70}$ Opac. vitr. (old).
12	Keever.....	52	Mature.	Diabetes with acetone.	Iridocyclitis.	Proj. faulty.
13	Goldberg.....	34	Hyper.(traum.)	+After section.	..	$\frac{20}{20}$
14	Donovan.....	60	Mature.	..	..	$\frac{20}{20}$
15	Held.....	83	Hypermature	..	..	$\frac{10}{200}$ Central choroidal changes.
16	Angier.....	61	Mature.	..	..	$\frac{20}{70}$ Central choroiditis, opac. vitr.
17	Everstein.....	82	Hypermature.	..	Hemorrhage in vitreous.	$\frac{20}{70}$ Myopia, choroidal change.
18	Mathews.....	61	Mature.	..	..	$\frac{20}{70}$ Opac. vitr.
19	Hamer.....	48	..	..	..	$\frac{20}{40}$ Membr. opac. vitr. (old).
20	Walsh.....	58	Immature.	..	..	$\frac{20}{20}$
21	Humphries....	64	Mature.	..	..	$\frac{20}{20}$ –
22	Sangmar.....	73	Hypermature.	..	..	$\frac{20}{70}$
23	Edelstein.....	64	Hypermature.	..	..	$\frac{20}{50}$ Opac. vitr.

24	Humphries....	64	Mature.	..	..	20/15 —
25	Steller.....	51	Mature.	..	..	20/15 —
26	Farian.....	70	Mature.	..	Cyclitis.	20/30 Opac. vitr.
27	McGivney....	65	Mature.	..	..	20/20 —
28	Wiener.....	67	Mature.	..	..	20/20
29	Stableford.....	60	Mature.	+ Followed lens.	Cyclitis.	20/70 Updrawn pupil, hyaloid cloudy.
30	Himmelweit...	70	Mature.	Previous glaucoma.	..	20/20 Optic atrophy.
31	Schnurle.....	64	Mature.	..	..	20/20 —
32	Terreforte.....	68	Mature.	..	..	20/20
33	Walsh.....	69	Immature.	..	..	20/20
34	Hipp.....	69	Mature.	..	..	20/20
35	Goldberg.....	44	Hypermature.	..	..	20/20
36	Shea.....	60	Mature.	+ Before extraction; spoon used.	Neuroretinitis.	20/30 Opac. vitr.
37	Buggie.....	75	Mature.	..	..	20/20
38	Goldbaum....	63	Mature.	..	..	20/20
39	Himovitch....	59	Mature.	+ On closing eye. Ruptured caps, extracted.	Neuroretinitis.	20/70 Opac. vitr. opac. corneæ.
40	Blumberg.....	55	Mature.	..	..	20/30
41	Gundel.....	66	Mature.	..	..	20/20
42	Randall.....	70	Mature.	..	Retrochoroid. hemorrhage.	Enucleation.
43	Harty.....	73	Mature.	+ Squeezed; after extraction.	..	20/30
44	Hoag.....	80	Mature.	+ Squeezed: after extraction.	..	20/40
45	Feltman.....	47	Mature.	..	Iris prolapse.	20/40
46	Greeley.....	68	Hypermature.	+ At end.	Iritis.	20/40
47	Ryan.....	48	Mature.	Projection faulty.	..	M.H. old detachment. Opac. vitr.
48	Panowitz.....	45	Immature.	..	..	20/70 Myopic choroidal changes.
49	Hauptman.....	70	Hypermature.	..	..	20/40
50	Levi.....	50	Mature.	..	..	20/30

No.	Name	Age	Condition of Lens	Vitreous or Complications	Healing	Final Result
51	Hinkovitz.....	65	Hypermature.	..	..	$\frac{20}{200}$
52	Goldstein.....	58	Mature.	..	..	$\frac{20}{200}$ –
53	Brown.....	74	Hypermature.	Corneal opacity.	..	$\frac{20}{200}$ Myopic choroidal changes. Opac. vitr.
54	McGivney....	65	Mature.	Corneal opacity.	Iritis.	$\frac{20}{70}$ Opac. vitr.
55	Matrass.....	72	Hypermature.	+ Capsule ruptured and extracted.	..	$\frac{20}{70}$
56	Zodikow.....	49	Immature.	Capsule ruptured and extracted.	..	$\frac{20}{30}$
57	Wehle.....	60	Hypermature.	..	..	$\frac{20}{70}$ Opac. vitr. (old), optic atrophy.
58	Janowitz.....	58	Mature.	..	..	$\frac{20}{200}$ Opac. vitr. (old).
59	del Valle.....	62	Mature.	..	..	$\frac{20}{200}$
60	Ginsberg.....	65	Mature.	+ Spoon delivery.	Neuroretinitis.	$\frac{20}{70}$ Opac. vitr.
61	del Valle.....	62	Hypermature.	+ After extraction.	..	$\frac{20}{200}$
62	Shapiro.....	49	Hypermature.	..	..	$\frac{20}{200}$
63	McNeeley.....	71	Hypermature.	..	..	$\frac{20}{200}$ Myopia, opac. vitr.
64	Gnautch.....	60	Immature.	..	Struck eye. Vitreous hemorrhage.	$\frac{20}{70}$
65	Jacobs.....	62	Mature.	..	..	$\frac{20}{200}$
66	Buchman.....	62	Hypermature.	..	..	$\frac{20}{200}$
67	Redinger.....	68	Mature.	..	Detached choroid; hemorrhage.	$\frac{20}{200}$
68	Fitzpatrick....	74	Mature.	..	..	$\frac{20}{200}$
69	Cook.....	60	Immature.	..	Detached choroid.	$\frac{20}{200}$
70	Fulham.....	58	Mature.	..	..	$\frac{20}{200}$ –
71	Sullivan.....	65	Mature.	Corneal opacities.	..	$\frac{20}{70}$ Maculæ corneæ.
72	Shapiro.....	49	Mature.	Capsule ruptured and extracted.	..	$\frac{20}{30}$
73	Barry.....	60	Mature.	..	..	$\frac{20}{200}$
74	Keeley.....	68	Hypermature.	..	Faint hyaloid opacity.	$\frac{20}{200}$ Choroidal changes.
75	Michelfelder..	72	Immature.	..	..	$\frac{20}{200}$

76	Binger.....	70	Immature.	Old glaucoma. Cystoid scar.	..	$\frac{20}{200}$ Deep corn. opac.
77	Harrison.....	51	Immature.	..	..	$\frac{20}{30}$ Opac. vitr.
78	Hirschfeld.....	64	Mature.	..	Prolapse iris.	$\frac{20}{30}$ —
79	Mayer.....	60	Mature.	..	..	$\frac{20}{30}$
80	Rosenfeld.....	57	Mature.	..	..	$\frac{20}{30}$
81	Maggio.....	60	Immature.	+ Followed extraction.	..	$\frac{1}{666}$ Myopic choroiditis; maculæ corneæ.
82	Shannon.....	71	Immature.	Previous glaucoma.	Cyclitis.	$\frac{20}{70}$ Updrawn pupil.
83	Barron.....	71	Immature.	..	..	$\frac{20}{30}$
84	Crosby.....	62	Immature.	+At end of operation.	..	$\frac{20}{30}$
85	Bergin.....	49	Hypermature.	..	Iris prolapse.	$\frac{20}{30}$
86	Kasnovitz.....	54	Mature.	+ With lens.	..	$\frac{20}{30}$ Opac. vitr.
87	Beyer.....	67	Hypermature.	Capsule ruptured and extracted.	..	$\frac{20}{200}$ Retinitis (diabetic).
88	Gleason.....	73	Hypermature.	..	..	$\frac{20}{15}$
89	Marshall.....	49	Immature.	..	..	$\frac{20}{30}$
90	Strohofer.....	78	Mature.	..	Partial iris prolapse.	$\frac{20}{30}$
91	Bause.....	74	Mature.	..	..	$\frac{20}{70}$ Central chorioretinitis (old).
92	Libenow.....	64	Mature.	..	..	$\frac{20}{30}$ Opac. vitr.
93	McKean.....	51	Mature.	..	..	$\frac{20}{30}$
94	Poppe.....	62	Mature.	..	Iris prolapse.	$\frac{20}{30}$
95	Rothnagel.....	75	Hypermature.	..	Vitreous hemorrhage.	$\frac{20}{100}$ Opac. vitr.
96	Gibson.....	60	Hypermature.	+ Spoon delivery.	..	$\frac{20}{30}$
97	Thompson....	69	Hypermature.	Capsule ruptured and extracted.	..	$\frac{20}{30}$ —
98	Sommers.....	60	Immature.	..	..	$\frac{20}{30}$
99	Woodhouse....	62	Mature.	..	Iritis.	$\frac{20}{30}$
100	McBurney....	73	Mature.	..	..	$\frac{20}{30}$ Opac. vitr.

+ indicates prolapse of vitreous.

SUMMARY: Mature 59; hypermature 26; immature 15.

Visual results: $\frac{20}{15}$, 5; $\frac{20}{20}$, 18; $\frac{20}{30}-$, 9; $\frac{20}{30}$, 27; $\frac{20}{40}$, 11; $\frac{20}{50}$, 7; $\frac{20}{70}$, 13; $\frac{20}{100}$, 1; $\frac{20}{200}$, 2; fingers, 4; projection faulty, 2; total loss, 1.

Prolapse of vitreous: 16. The slightest loss of vitreous is counted: usually very small in amount; decided loss in 1 only.

Visual results of this group of vitreous prolapse: $\frac{20}{20}$, 1; $\frac{20}{30}$, 7; $\frac{20}{40}$, 2; $\frac{20}{60}$, 1 (Traumatic cataract); $\frac{20}{70}$, 4 (2 Mac. corneæ); $\frac{5}{100}$, 1 (Myopia, Mac. corneæ).

Capsule ruptured during extraction, separately extracted, 6.

Iridocyclitis: 9; Iritis, 6; Cyclitis, 3.

Prolapse of iris: 6 (including incarceration).

Detachment choroid (transient), 2.

Hemorrhage in retina and vitreous: 4 (1 of these traumatic).

Retrochoroidal hemorrhage: 1.

Uncomplicated: 76.

Complicated: 24.

Dystrophia corn. epithel	1
Mac. corneæ	3
Central chorioretinal changes	6
Optic atrophy	1
Glaucoma (previous)	3
Detachment retina	1
Hemorrhage	1
Myopia (choroidal changes)	4
Opac. vitr. (old)	4

Of the 76, 68 obtained vision $\frac{20}{15}$ to $\frac{20}{40}$, 97 per cent.

2 " " $\frac{20}{50}$

4 " " $\frac{20}{70}$

1 " " $\frac{20}{100}$

Projection faulty, 1 (iridocyclitis, in diabetic subject with 8 per cent. sugar, aceton, and diacetic acid).

The advantages of an extraction in the capsule are, I think, generally accepted. The beautiful black pupil, the unusual freedom from ciliary congestion, from iritis, and all the troubles which retained cortex and capsular thickenings may cause, not to speak of the secondary operation, often more difficult than the primary extraction, must be convincing arguments in favor of the extraction in the capsule operation if the dislocation of the lens could only be simplified and the eye not subjected to too great risk. This is partly accomplished by the method of subluxation with the capsule forceps. The dislocation with the capsule forceps, however, only succeeds in a certain percentage of cases, which, roughly speaking, is

from 40 to 50 per cent. The procedure generally fails in cataracts where the capsule is very thin and the subcapsular opacity is an uneven bluish white. The operation should not be undertaken in unreasonable patients. It succeeds proportionately with the age of the cataract; the dislocation takes place easily in the hypermature and sclerosed lenses, many of the latter being quite immature, and considerable sight remaining. In the "disciform" variety extraction in the capsule with forceps dislocation is much easier than by the Smith method.

Nearly a year after I began with this operation, Stanculeanu reported at the meeting of the German Ophthalmological Society upon a method of extraction of cataract in the capsule, which seems to be practically the same as the one described in this paper. In a later article[1] he says that in the Bucharest Clinic, Manolescu had for sixteen years practised removal of the anterior capsule of the lens in the cataract operation by means of the convex curve of the ordinary iris forceps without teeth. Stanculeanu abandoned the Smith operation after a trial of twenty cases, and developed a method of extraction in the capsule after dislocation with this Manolescu forceps which he had modified by the addition of a narrow groove along each branch of the forceps. He succeeded in dislocating the lens in the capsule with this forceps in 50 to 70 per cent. and is very well satisfied with his results. I have not used the Manolescu forceps, so I cannot compare it with the Kalt. The late Dr. Greene, of Dayton, Ohio, had used both forceps and preferred the Manolescu model, which he had had changed slightly by making the ends bulbous.

It seems to me that this is a legitimate and conservative development of our operative treatment of cataract which insures for many of our cataract patients the advantages of removing the cataract in the capsule without subjecting them to greater risk than the ordinary operation. If the subluxation does not succeed, a much larger piece of the anterior capsule is removed than with the toothed capsule forceps; the operation, otherwise, does not differ from the usual one. Improvement in technic and in instruments should increase the percentage of cataracts which are capable of dislocation by this method.

[1] *Klin. Monatsbl. f. Augenheilk.*, p. 527, 1912.

PURULENT MENINGITIS FOLLOWING PENETRATION OF AN EYEBALL BY A FISHHOOK.[1]

By CLARENCE A. VEASEY, M.D., Spokane, Washington.

THE following case herewith presented seems to the writer to possess a sufficient number of unusual and interesting points to merit its isolated report.

The patient, a strong but highly nervous, well preserved man, aged 66 years, accustomed all his life to living out-of-doors, had the misfortune to have a flyhook penetrate near the center of the left cornea, on a back cast of his line, at 11 A.M., August 3, 1912. The barb passed to the interior of the eye, the point of the hook penetrating the lens. The patient was obliged to walk two miles along the mountain stream where he was fishing, and then row a boat about four miles across the lake into which the stream emptied, and drive his own automobile twenty miles, most of the distance being along a bad lumber road through the woods, before medical assistance could be obtained. The hook penetrated the eyeball about 11 A.M. and it was after six the same evening, or seven hours later, before the hook was removed by the family physician, Dr. J. H. King of Cranbrook, B. C. The dangers of infection and sympathetic inflammation were explained to the patient, and he was advised by his physician to have the eyeball removed at once, but declined.

He was brought to Spokane by his son-in-law, Dr. F. W. Green of Cranbrook, the following day, this being the earliest that he could reach the city, arriving about 8 P.M., August 4th, at which time the writer made his first examination. There was found a small ragged wound near the center of the cornea, about 4*mm* in length, the anterior chamber was abolished, the pupil contracted, and all of the iris appeared to be covered with a very thin layer of pus. A moderate amount of œdema of the conjunctiva was

[1] Read at the annual meeting of the Pacific Coast Oto-Ophthalmological Society, July, 1914.

beginning below. The patient again declined immediate enucleation, and an effort was made to save the eye.

He was taken at once to the hospital and placed under the care of competent nurses, constant cold compresses through thin antispetic dressings being employed. Saline irrigations, atropin, and argyrol were used every third hour, the eye being immediately dressed again.

On the following morning, August 5th, twelve hours after the patient was first seen, the conjunctival œdema was somewhat more marked. There was some pus in the anterior chamber and the latter had not yet reformed. The wound was opened, the pus evacuated, and two drops of a 25 per cent. solution of argyrol were injected into the anterior chamber. Cold compresses, saline irrigations, atropin, and argyrol were continued as before. The same evening, August 5th, or less than twenty-five hours from the time the patient first came under observation, or fifty-seven hours from the time the fishhook penetrated the eyeball, the œdema was so extensive that the cornea was completely surrounded, and it was with difficulty that the eyelids were closed. Some pus was again showing in the anterior chamber, and consent being now obtained the eyeball was immediately enucleated, about 8 P.M. Upon opening the eyeball, immediately after enucleation, a thin grayish line was found extending from just behind the lens through the vitreous almost to the optic nerve.

The following morning the patient was doing exceedingly well, having spent a very comfortable night. There was no temperature, which had only been running as high as 99.5° for a day or so previous, and the patient expressed himself as feeling particularly well, barring the extreme reaction from his tremendous nerve strain.

At 5 P.M., August 6th, eighty hours from the time of the penetration of the eyeball by the fishhook, there occurred a severe headache, which became almost unbearable some hours later. Together with this there were marked nervousness, restlessness, irritability, and tossing around in bed. The temperature was 104.6°, per rectum. There was no nausea or vomiting, and no chills had occurred. The headache was controlled by hypodermics of morphia and ice-bags applied to the head.

The following morning, August 7th, at six o'clock, there occurred slight nausea and vomiting. The headache had entirely disappeared, but the patient was quite deaf, the deafness being so marked in the right ear that it was impossible for him to hear even shouting. No deafness had ever been observed before. The patient was still restless, but there were no muscular twitchings, no impairment of

any muscles, no rigidity of the neck, and no Kernig sign. A consultation was now held with Dr. Wilbur Mackenzie and Dr. James Neff. The temperature was 99.5° by mouth, the patient much more comfortable, but quite nervous, irritable, restless, and desired to be let alone. The pupil was contracted, the contraction being accounted for by the hypodermics of morphia, and no optic neuritis was present. Bromide of sodium and chloral were given every three hours to quiet the patient, and on the morning of August 8th another consultation was held with Drs. Mackenzie, Neff, and Green. A blood count made by Dr. M. M. Patton showed 23,000 leucocytes. The stump of the enucleated eye was quite clean and of a healthy appearance, but an attempted culture was made of some of the mucus present, there being no more than is found in every case of enucleation. Not the slightest œdema in the socket was observed at any time.

At 2:30 P.M., August 8th, with Drs. Mackenzie, Neff, and Green a lumbar puncture was made. The fluid came off with great force and at first was clear, soon becoming milky, the last amount being quite thick and looking almost like pure pus. Stained smears showed a pure culture of an encapsulated pneumococcus, which Dr. Patton subsequently found upon cultivation to be the pneumococcus of Fraenkel. Immediately 40*cc* of antipneumococcus serum were injected and the preparation of vaccine from the germ found immediately begun. The blood pressure was 155. About 10 P.M., August 8th, the patient became unconscious, having been delirious the previous day, and about 2:30 A.M., August 9th, began to sink gradually. At 3 P.M., August 9th, the vaccines were ready and employed, although the case was at this time practically hopeless. The patient remained in an unconscious state after 2:30 A.M., August 9th, and died at ten o'clock the same evening. At no time had there been any paralyses or convulsions. The urine remained normal at all times.

Briefly, therefore, we have a case of penetrating injury of an eyeball by a fishhook, the fishhook remaining in the eye for seven hours before its removal. The patient, a highly nervous, aged individual, suffered keenly during that interval by a two-mile walk along a mountain stream, a four-mile row across a lake, and a twenty-mile drive in his automobile, most of the distance being along what is known as a lumber road, requiring the most careful attention and concentration. The hook is then cut out and enucleation advised but declined. Thirty-three hours

after the accident the wound was found open, ragged, and the iris covered with a thin layer of pus. Fifty-seven hours after the accident the eyeball was enucleated and a thin grayish line observed extending almost back to the optic nerve. Upon opening the eyeball and observing this line, a remark was made by the writer to those present in the operating-room that he was afraid the operation was too late and that the micro-organisms had already gained access to the brain. It is to be regretted that no microscopic examination of the eyeball was made, but the specimen was unfortunately lost. Eighty hours from the occurrence of the accident, symptoms of purulent meningitis presented themselves, death occurring on the third day thereafter, or on the sixth day following the injury.

Formerly such a case might have been reported as one of meningitis following enucleation. The earliest of such reports was made by Pagenstecher in 1873, when he recorded a case of fatal meningitis following enucleation of the left eyeball with sympathetic iridochoroiditis in the right. Subsequently similar cases were reported by Meyhoefer, Lèber, Benson, Brückner, Katzenstein, Priestly Smith, and Davidson. In 1885, Nettleship, in reporting one of his own cases before the Ophthalmological Society of the United Kingdom, collected and reviewed thirty-three others, making a total of thirty-four at that time. Out of this number five recovered after having shown well-marked signs of meningitis, while twenty-nine died. Most of the fatal cases terminated in from two to four days after the beginning of meningeal symptoms, the longest period of time being eight days after the enucleation had been performed, the symptoms manifesting themselves in almost all the cases within the first forty-eight hours.

This naturally suggests at least the possibility that the operative procedure may have had something to do with the development of meningitis in these cases, but it by no means proves that the infection may not have taken place before the enucleation was performed.

And that such is not only possible but highly probable is shown by C. Devereux Marshall in his excellent paper published in 1897 in the *Royal London Ophthalmic Hospital Reports*. Marshall, who was the curator of the museum at

Moorfields, found that 6580 eyes had been enucleated in that hospital between the years 1861 and 1896, and that there had been recorded eight fatal cases, all of them occurring after 1880. In analyzing these cases and studying them both clinically and microscopically, he found that the changes present indicated in most of them that the disease was of older standing than the symptoms would seem to indicate. Practically all of the patients were found also to have been in a condition of poor health at the time of operation. Furthermore, death from meningitis has occurred in cases of infected eyeball without operation, as in the case of Mr. Tay (*Royal London Ophthalmic Hospital Reports*, vol. 7, p. 506). Mr. Tay also reports another similar case in the paper by Marshall above referred to. In the paper by Nettleship, to which I have alluded, three cases of meningitis are reported, occurring as a result of infected eyeballs in which no operative procedure was undertaken, two of these cases terminating fatally.

It has been proved definitely that many cases of meningitis have been started by an eye containing pus, and the old idea that it was dangerous to remove an eye in this condition, and that when meningitis developed it was due to the excision, probably originated, as pointed out by Marshall, from the fact that fatal cases have been reported under these circumstances. Because, however, such unfortunate events have occurred, it by no means proves they were due to the enucleation, and in fact a careful study of most of the reported cases certainly indicates that in all probability the meningeal infection preceded the operation, but the symptoms manifested themselves after the operation had been performed.

The infection may enter the brain from the eye either by passing directly backwards along the structures entering the cranial cavity by the sphenoidal fissure and optic foramen, or by means of the blood and lymph stream. When entering by the first route, the post-mortem examinations have shown the base of the brain to be the most affected. If the infection enters, however, by means of the blood or lymph stream, the post-mortem examination is apt to reveal trouble in the sinuses and on the surfaces of the brain.

In the case herewith reported it would seem probable, because of the thin grayish line extending almost back to the

optic-nerve entrance, that the infection entered the brain by way of the optic nerve, and that had the eyeball been removed at a sufficiently early period the meningitis might have been prevented

The conclusion to be drawn is that, given a case of infected eyeball in which excision must be performed, the earlier it is done the less probability will there be of the infective material having passed to the brain.

The summary of Mr. C. Devereux Marshall's paper is of such interest in this connection that it is added:

"1. Meningitis may be present for a certain time without there being sufficient symptoms to enable one to diagnose the disease.

"2. Meningitis has been known to follow other operations besides the excision of suppurating eyes, and cases are also recorded in which the excision of an eye which was not suppurating has been followed by death from meningitis.

"3. The changes seen in many cases indicate that the disease is of older standing than the symptoms would appear to indicate.

"4. Infection may occur at any time from an eye which is suppurating, and the longer the pus is shut up in the eye the greater is the risk, and the greater will be the absorption of the products of suppuration.

"5. There are two ways in which meningitis may arise: (*a*) by direct extension along the optic nerve and structures passing through the sphenoidal fissure; (*b*) by infective material being carried along the vessels.

"6. The sooner the pus is got rid of the better, and if it is thought undesirable to excise the eye, it should be at once opened, the contents completely removed, the sclerotic thoroughly scrubbed out, and both it and the surrounding parts rendered aseptic. Owing to there being no clear cornea to injure, a far stronger antiseptic may be employed than would be possible if a seeing eye were present.

"7. As the products of putrefaction may have soaked into the sclerotic and have infected the surrounding parts, it is far better to remove it; good drainage is then insured, and every piece of useless and suppurating tissue is removed."

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LOSS OF VITREOUS IN THE INTRACAPSULAR CATARACT OPERATION AND ITS PREVENTION.[1]

By W. A. FISHER, M.D., Chicago.

(With nine cuts in the text.)

IF a cataract operation could be performed without the loss of vitreous, it would make a great step forward, and, if a loss of vitreous could always be avoided when the lens was removed in its capsule, then the intracapsular operation for senile cataract would be the best operation.

A loss of vitreous during a cataract operation, by any of the various methods now in vogue, may occur in a certain per cent. of operations; and, when a loss precedes the exit of the lens, the complication is considered one of great importance. It is admitted by operators, who are familiar with all methods of operating, that a loss of vitreous occurs more frequently in the intracapsular operation than by the capsulotomy method, and if this loss of vitreous could be avoided, the intracapsular operation could be performed without any more danger to the eye than by other methods.

Cause of Loss of Vitreous

There are two causes for the loss of vitreous: First, the patient may be unruly, but this is not often; and, second, the fault is with the operator, who does not take all precautions. Some time before the operation the patient may be given a sedative to keep him quiet; but if the operator gives him pain during any part of the operation, he cannot be expected to keep his eye quiet. The greatest responsibility rests upon the operator, and he should protect the patient as

[1] Read in part at meeting of Am. Acad. of Ophth., etc., Boston, Oct., 1914.

much as possible against all accidents. The two great factors producing loss of vitreous are pressure upon the eyeball by the lids and pressure upon the eyeball by the operator in removing the lens. Pressure upon the eyeball by the lids can be practically eliminated by discarding all kinds of specula and holding the upper lid away from the eyeball by my retractor and double hook (Fig. 1).

FIG. 1.—Author's lid elevator and double hook.

Technic of the Lid Hook

To operate upon the right eye, the assistant stands on the left side of the patient, introducing the lid elevator under the upper lid, holding it up with his right hand, his fingers resting upon the patient's nose, and the lower lid is kept down with his left thumb (Fig. 2). When operating on the right eye, the operator stands behind the patient during the incision and the iridectomy and to the right side and in front of him while extracting the lens. When the incision has been finished and the iridectomy performed, the assistant removes the lid retractor and introduces the double hook. In this position of the lid the operation is finished and the lid closed before removing the instrument, a second assistant or nurse being necessary to hold the eyebrow up during the operation and another to fix the eyeball while making the iridectomy. When operating on the left eye, the surgeon makes the incision with his left hand, and the assistant keeps the same position as in operating upon the right eye, but if he makes the incision upon the left eye with his right hand, standing on the left side and in front of the patient, the assistant should stand upon the right side of the patient, holding the lid up with the lid elevator in his left hand and keep the lid down with the thumb of his right hand. When the incision is finished, the assistant removes the lid elevator, stands upon the left side of the patient, introduces the double hook when the iridectomy is made and the

operation finished, with the assistant's fingers resting upon the side of the face, instead of nose, and the same position assumed as when operating upon the right eye. The operator stands upon the right side of the patient in delivering the lens in either eye. There are two positions for the double hook, one for holding the lid up and away from the eyeball (Fig. 2), the other, the patient being nervous or an impending danger of loss of vitreous, when the lid should be pulled down toward the patient's feet (Fig. 3). A little drilling will soon make

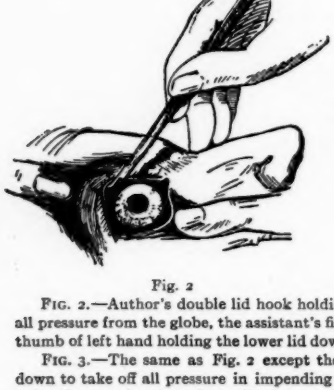


Fig. 2

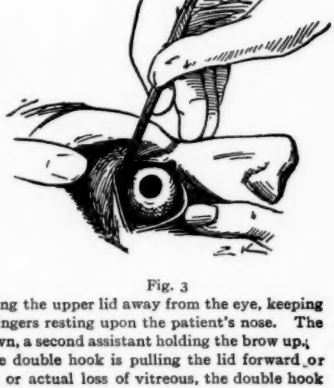


Fig. 3

FIG. 2.—Author's double lid hook holding the upper lid away from the eye, keeping all pressure from the globe, the assistant's fingers resting upon the patient's nose. The thumb of left hand holding the lower lid down, a second assistant holding the brow up.

FIG. 3.—The same as Fig. 2 except the double hook is pulling the lid forward or down to take off all pressure in impending or actual loss of vitreous, the double hook being depressed to keep from slipping out from under the lid.

any physician or nurse a good assistant.

Pressure upon the eyeball by the operator in removing the lens need not be so great in the capsulotomy as is required in the intracapsular method, and the pressure in the intracapsular method can be greatly modified by the use of my new instrument (Fig. 4). This instrument is a modification of the Smith spoon with a Smith spoon on one end and a very sharp needle on the other. The spoon end is used for the delivery of the lens when vitreous has escaped. I do not know of any instrument that will do as well for that purpose. The needle is used to avoid loss of vitreous. The danger of loss of vitreous in the intracapsular operation occurs when

the lens appears to be larger than the corneal opening and pressure is exerted that either bursts the capsule or causes loss of vitreous before the lens has been delivered. At this critical moment, when the operator has made what he considers safe pressure and the lens does not move but is sticking in the gaping corneal wound, the point of the needle is stuck into the lens and the lens gently lifted past the obstruction, when the delivery is finished by pressure upon the cornea with the hook according to the Smith method (Figs. 5, 6, 7).

FIG. 4.—Author's needle and Smith spoon.

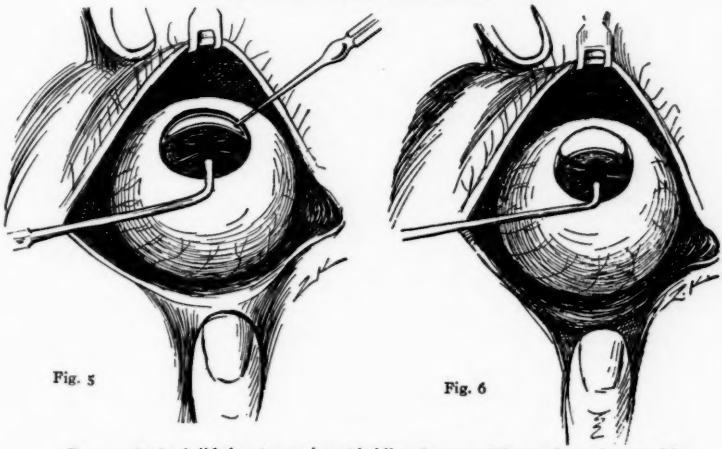


Fig. 5

Fig. 6

FIG. 5.—Author's lid elevator, assistant holding the upper lid away from the eye with right hand, the lower down with the thumb of the left hand, a second assistant holding the brow up. The hook is laid flat upon the cornea and pressure is made directly back toward the optic nerve. Safe pressure has been made but the lens will not move forward. The needle is inserted into the lens and it is gently lifted past the obstruction and the operation finished by the Smith technic. See Figures 6 and 7.

FIG. 6.—A continuation of Figure 5. Author's double lid hook holding the upper lid away from the eyeball with the right hand, the lower down with the thumb of left hand. A second assistant is holding the brow up, while the Smith hook is making pressure directly backwards towards the optic nerve. The pressure is kept up until the lens has passed the equator.

It would seem that anyone should be able to deliver the lens in its capsule after an experience of 576 operations under the guidance of Colonel Smith. And, I am satisfied from this experience that any operator will have an occasional loss of

vitreous by using pressure alone, and be compelled at times to deliver the lens with the spoon when loss of vitreous has preceded the delivery of the lens (Fig. 8).

I believe loss of vitreous can be made as infrequent by the intracapsular method with the Smith technic as occurs in the old operation with the old technic. It is not possible for me to state how many capsules will burst when the needle is used, because it may either burst when excessive pressure is used or when a loss of vitreous occurs. When Dr. Vail of Cincinnati and the late Dr. Greene of Dayton, Ohio, returned from India and explained the Smith technic to the Chicago Ophthalmological Society, they told us to use the spoon to make a little extra pressure when the lens appeared to be sticking in the gaping corneal wound. Five years later, when I was in India, I found the spoon practically discarded for producing pressure and only used in impending or actual loss of vitreous. Smith made this change because he found that doctors coming to him had great difficulty in using the spoon, and that their left hands could not be used as well as their right. He now uses the spoon only in impending or actual loss of vitreous, depending upon the hook for pressure upon the lens. I would suggest that the spoon be used only when vitreous has escaped and, if the needle is used when there is impending loss of vitreous, the spoon will seldom be used. The more skillful the operator is, in removing the lens in its capsule, the less often will he be called upon to use the needle or the spoon. The Smith technic should be mastered by good operators on pigs' eyes before an intracapsular operation is attempted. The needle is used only in difficult cases, and no more serious accidents are likely to occur than a bursted capsule; and, in that event, the result would be the same as though the old operation had been performed, and the capsule left in the eye. If the capsule has been ruptured in a tumbler—that is, a lens which is delivered lower side first—the zonula will have been broken below and the capsule will be found protruding from the corneal wound when it can be easily removed with a plain dissecting forceps.[1] If the capsule has been ruptured either by excessive pressure or by the needle while the lens is being delivered in the upright method, as in the immature, the toilet

[1] Fisher, *Ophthalmology*, April, 1914.

should be made first and then the attempt made to remove the capsule with my capsule forceps (Fig. 9). If the capsule is

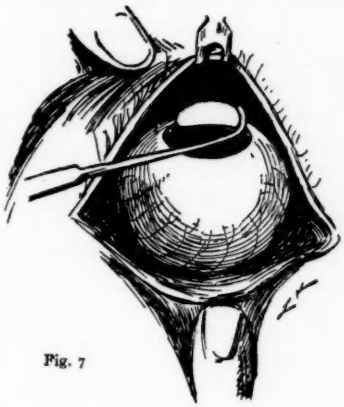


Fig. 7

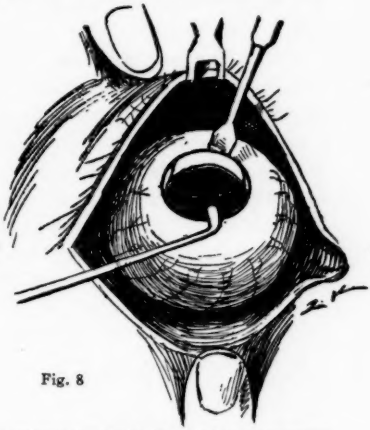


Fig. 8

FIG. 7.—A continuation of Figure 6. Author's double lid hook holding the upper lid away from the eye while the Smith hook is removing the lens, which is hanging in the wound. The hook is turned up to avoid rupturing the capsule.

FIG. 8.—Author's double lid hook holding the upper lid away from the eyeball, the ower down with thumb of left hand. A second assistant is holding up the brow. A slight amount of vitreous has escaped, pressure of the hook has been removed, and the Smith spoon introduced behind the lens. When the spoon is well in behind the lens, pressure is again made upon the cornea with the hook and the lens is expelled, using the spoon as a background to make pressure. In this manner the minimum amount of vitreous will be lost. This technic can be fairly well mastered by practice upon a dog's or pig's eyes in a mask.

FIG. 9.—Author's capsule forceps.

not removed in this manner, a large opening will have been made in it which will usually obviate the necessity of a secondary operation. If the lids are held away from the globe in a proper manner, a bead of vitreous, but no more, may follow, and this need not be considered of any special danger.

I hesitate to modify the Smith technic, and he may not accept this suggestion, but I believe it will be of great benefit to less skillful operators than Smith. Smith is a very careful observer and will accept reasonable suggestions from anyone and try them out. I offered several suggestions when I was working with him last year, and I cannot recall any that he did not try

except the needle. I proposed the needle to him when I found the lens sticking in the corneal wound and felt as though the capsule would burst or a loss of vitreous would occur if I made more pressure, but he told me he thought it would be safer for me to stick to the spoon. I did not mention the needle to him again because I was not sure that it would be of any value, and furthermore I was not in India to teach Smith how to operate. As soon as I arrived in Chicago, I had the instrument made and began its use at once and I am using it now in every case when I feel that there is danger of losing vitreous. I have used the needle long enough to convince myself that it is a valuable instrument, and I believe it will aid operators in the extraction of the lens in its capsule.

Few Operators Are Ambidextrous

Operators who feel that they cannot depend upon their left hand could have an assistant introduce the needle when it is necessary to give this little assistance. The technic of the needle can be obtained by operating upon pigs' eyes in a mask. One eye will be quite sufficient for a long practice, because when operating upon pigs' eyes it is not necessary to remove the lens but simply to introduce the needle to assist the lens towards the exit, then let it slip back into the eye and repeat the technic as many times as is necessary to master it. The spoon delivery can be mastered in the same manner. Operators who do not have competent assistants can perfect them by practice upon animals' eyes. I formerly advised the use of the capsule forceps when the lens could not be delivered by safe pressure, and I am now recommending the use of the needle at this critical time.[1]

We are all striving to avoid loss of vitreous, post-operative inflammation, secondary operation on the capsule, and infection, and to give our patients the best possible vision. If we open the capsule and extract the lens but leave the capsule in the eye, a foreign body is retained which has a tendency to cause post-operative inflammation, necessitates secondary operation, and increases the danger of infection, because we expect and often get post-operative inflammation which makes it imperative

[1] Fisher, *Ophthalmology and Oto-Laryngology*, 1910.

that we open and treat the eye before the corneal wound is closed and thus increase the danger of infection on account of repeatedly opening the eye. If a successful operation has been performed by the old method, the patient is either dismissed at the end of two weeks or more to return for a needling if necessary, or is requested to remain in the hospital until this has been done. The patient is usually under observation in or out of the hospital more than twice as long as would be required if the lens has been removed in its capsule; and, when he is discharged and a needling has been performed, we cannot be sure that the capsule will not obstruct his vision at some future time.

Disadvantage of the Intracapsular Operation

Loss of vitreous seems to be the one great disadvantage of the intracapsular operation. If this could be overcome I believe the intracapsular operation would be the operation of choice.

Advantages of the Intracapsular Operation

First. The intracapsular operation can be performed as soon as the patient is unable to attend to his ordinary duties.

Second. The intracapsular operation is especially indicated in immature cataract.

Third. The patient is operated upon when his health and spirits are good.

Fourth. Post-operative inflammation rarely follows the intracapsular operation.

Fifth. Secondary operation is not necessary.

Sixth. Less danger of infection.

Seventh. Average time in the hospital, less than half as long as in the old operation.

Eighth. Visual results better.

I have arrived at these conclusions on account of having operated by the capsulotomy method for more than twenty years and of having performed more than six hundred intracapsular operations.

OPHTHALMOPLEGIA INTERNA, THE RESULT OF LEAD POISONING.

By L. D. BROSE, M.D., Ph.D., F.A.C.S., Evansville, Ind.

OCCUPATIONAL diseases, while not holding the importance for the eye specialist that they do for the general practitioner, are nevertheless not to be wholly neglected by him, since, aside from a diagnostic standpoint, and our interest in the conservation of vision movement, it should be remembered that certain of our States have made it obligatory for all physicians to report to designated State authorities such occupational diseases as may come to them for treatment.

The case I have to report presents the following history:

J. T. C., æt. 25 years, married, and a foreman painter in a very large buggy factory, consulted me November 15, 1913, because of sight failure. He has always enjoyed good health, is not addicted to tobacco or alcohol, nor taken medicine of any kind recently. Syphilis is positively denied. About his clothing I at once detected a strong odor of paint, and he admits that he has been very much in contact with lead during long working hours. Aside from difficulty in seeing, however, he has no complaint. The eyes were not inflamed, but both pupils were widely dilated, but responsive to convergence. Vision in either eye is $\frac{15}{60}$ for distance, while near he is unable to read smaller than Sn. 4. The sight in the right eye was improved with + 0.50 cyl. ax. 90° to $\frac{15}{20}$, and that in the left eye with + 0.50 spherical likewise $\frac{15}{20}$ for distance. Near, either eye read Sn. 0.50 with the help of + 4.50 spher. Ophthalmoscopic examination disclosed no evidence of disease in the fundus, and a careful examination on the perimeter disclosed no loss in the visual fields for either color or form. A diagnosis of nuclear lead palsy was made notwithstanding the absence of general symptoms, and the patient cautioned to abstain from handling lead as much as possible. Iodide of potash

three times daily was prescribed, and a cathartic dose of sulphate of magnesia. Patient made a rapid recovery and I did not see him again until April 13, 1914, when he came because of recurrence of poor sight. Again I detected a very strong odor of paint about his person, and upon questioning him he admitted that recently his work had been unusually heavy and that he had found it necessary to work overtime and spend more hours in the paint-shop than usual. The pupils were normal in size, reacted well to light and convergence. A test for visual acuteness gave the following: O. D. $\frac{15}{20}$, improved to $\frac{15}{15}$ with + 0.25 cyl. ax. 90°; O. S. $\frac{15}{15}$. Near vision either eye Sn. 1.00, improved to finest Sn. with the help of + 1.50 spher. There was no detectable disease in the fundus and the visual fields were normal. Treatment: Purgative doses of sulphate of magnesia twice weekly, and iodide of potash, grains five, three times daily. He was again advised to abstain from handling paint as much as possible. The result was a rapid restoration of his sight.

Cases of palsy of the eye muscles due to plumbism cannot be very common, since Dr. J. C. Wilson[1] makes the statement that paralysis of the face or eye has never been observed in consequence of lead poisoning. W. F. Norris[2] states that in fifteen thousand case records in hospital practice only three undoubted cases of lead amblyopia have presented themselves; while Uhthoff says, "as compared with the number of cases of toxic amblyopia from other causes, that produced by lead represents a small percentage," only one case of lead amblyopia being found among one hundred and thirty-eight cases of toxic amblyopia analyzed by him. Of the eye disorders resulting from lead poisoning, affections of the optic nerve occur oftenest. Oliver[3] differentiates two forms of neuroretinitis. The acute form, seen in connection with lead encephalopathia, in persons who have been employed in handling lead but a short time. These patients complain of headache, vomiting, sudden blindness, and convulsions. As a rule, atrophy of the optic nerve ensues, the disk becoming pale, of irregular contour, with narrowing of the retinal arteries. The urine may be free from albumin and the brain and meninges

[1] Pepper, *System of Medicine.*
[2] Norris and Oliver, *System of Diseases of the Eye.*
[3] Oliver, *British Med. Journal*, Mch. 21, 1891.

without material alteration. The second form is seen in chronic lead poisoning, often in association with kidney disease and albuminuria. Amblyopia, of transient duration and sudden in onset, without appreciable ophthalmoscopic changes, and due to a direct effect of the lead on the nerve centers, akin to what takes place in uræmic amaurosis, has been reported in some of the cases. However, the neuritis may precede the albuminuria and end in atrophy long before kidney symptoms arise. The field of vision may be that of typical retrobulbar neuritis with its central scotomas, or there may be concentric contraction for form and colors, or contraction and peripheral relative scotomas. Bihler[1] reports a case of complete homonymous right-sided hemiachromatopsia. Since there are no special eye symptoms that permit of a diagnosis of lead poisoning, the history of the patient's exposure to lead absorption in connection with such general symptoms as pallor of the skin, reduced hæmoglobin, general muscular weakness, rheumatic pains, especially in the back and joints, gastrointestinal symptoms, colic without tympanites or temperature elevation, constipation, loss of appetite, and vomiting must be sought for. General nervousness, persistent headache and dull mentality with wrist drop, bluish line on the gums, basophilic degeneration of the red blood cells, and detection of lead in the urine are conclusive evidence of plumbism. The seat of the eye lesion in lead poisoning is, as a rule, either nuclear or peripheral. The retinal arteries may suffer narrowing through endarteritis, even to obliterans in places.

[1] Bihler, *Knapp's Archives of Ophthalmology*, vol. xxx., No. 4, p. 508.

CONCERNING REMOVAL OF THE EYEBALL.

I.

EXENTERATION *VERSUS* ENUCLEATION.

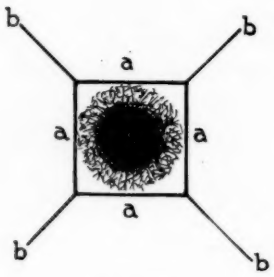
By HARRY S. GRADLE, M.D., Chicago.

(*With two cuts in the text.*)

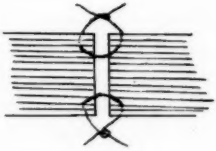
IN compiling this series of cases of removal of the eyeball for various reasons, it seemed advisable to discuss the subject from three aspects. The material was divided, therefore, into three separate papers, as the consideration of each phase was too lengthy. This, the first of the triad, is devoted to the question as to whether enucleation is preferable to exenteration, or *vice versa*, and in which case each operation is applicable. In the second article of the series will be considered the implantation of fat into the orbital or scleral cavities after removal of the visual organ, while the third will deal with ciliary ganglion anæsthesia.

Among American ophthalmologists, the practice of exenterating the eyeball is confined almost exclusively to cases of panophthalmitis. Removal of the eye for other causes is usually performed by the simpler operation of enucleation. This prejudice in favor of the latter operation is almost nation-wide and deserves a few words of comment. The ensuing discussion is based upon the operations of enucleation and exenteration that have been performed during the past four years in the German University Eye Clinic in Prague. To Professor Elschnig, who kindly allowed me the use of this material and counseled me during the compilation, I am deeply indebted.

There is no necessity of detailing at length the technic of either operation, for admirable descriptions of both are to be found in Czermak–Elschnig, as well as in Beard, Meller, and other standard textbooks of ophthalmic surgery. Ganglion anæsthesia was used whenever possible, the details of which will appear in a future article. In enucleations, the technic did not vary from that employed in this country. The endeavor in eviscerating was to leave the concavity of the sclera free from any adhering particles of choroid, and to this end the uvea was loosened with a spatula before endeavoring to scoop out the intraocular contents. After excision of the cornea by a quadrangular incision (Sketch 1), the ciliary body was frequently found to be adherent to the sclera at the points a–a. These adhesions were loosened with the small cyclodialysis spatula. Especially in chronic iridocyclitis, adhesions between the anterior portions of the choroid and the sclera were found to be present; these were loosened in the same way. The contents of the globe were then scooped out with the dull Bunge spoon, after which all hemorrhage was stopped by pressure alone. When no more blood was present, the cavity was inspected for choroidal remnants, which, if found, were removed with a sharp Bunge spoon. Four flaps of the scleral mouth were then made by four scleral incisions (Sketch 1-b–b), and the wound either closed and covered with conjunctiva, or drained with gauze, as the case required. In case of complete closure of the scleral cavity, the two vertical flaps were first sutured together with buried knots (Sketch 2), and then the horizontal flaps.



SKETCH 1



SKETCH 2

The following table gives a brief résumé of the 153 cases and needs but little explanation. The diagnoses were empirically

divided into three main and two subheadings in the endeavor to formulate indications for the type of operation. Under "Acute Mycotic" are classed those cases of acute bacterial inflammation whose ordinary course was less than fourteen days in length. The subheading of "Acute Non-Mycotic" includes the acute non-bacterial inflammations of short duration as traumatic iridocyclitis. "Chronic Mycotic" inflammations cover the low-grade infections existing for more than fourteen days, while the "Chronic Non-Mycotic" subheading is represented by such cases as traumatic iridocyclitis that could lead to a sympathetic ophthalmia (Schleichende Iridozyklitis"). Under "Non-Inflammatory" are classed cases of glaucoma, Atrophia bulbi dolorosa without uveal inflammation, traumatic uveal prolapse, etc.

	Enucleation.	*Exenteration.*
Male	48	71
Female	19	15
Total	67	86
Ganglion Anæsthesia	51	38
Other Anæsthesia	16	48
Diagnosis:		
1a. Acute Mycotic	8	44
1b. Acute Non-Mycotic	3	13
2a. Chronic Mycotic	1	0
2b. Chronic Non-Mycotic	13	8
3. Non-Inflammatory	42	21
Results:		
Healed smoothly in less than 10 days	62	55
Healing prolonged more than 10 days	5	17
Suppuration	—	2
Suppuration and Scleral Sloughing	—	12
Secondary Paraffin Injection	—	14

The course of healing was again empirically divided into a period of less than ten days, and a period greater than ten days merely for the sake of classification. The few cases of suppuration and subsequent scleral excision were classed by themselves. Secondary paraffin injections were made fourteen times after evisceration in the endeavor to produce a larger stump, more freely movable for the prothesis.

As can be seen from the table, 42 of the 67 enucleated cases,

or 62.5%, were operated upon by this method because of a non-inflammatory condition; while among 86 cases that were eviscerated, the operation was performed 57 times, or in 66.2%, because of acute inflammatory trouble. By far the majority of the enucleated cases healed smoothly in less than ten days. Among the eviscerations, 17 required a greater period of time for healing. In two further cases there was suppuration following the operation, certainly due to pre-operative infection of the sclera, as both were cases of panophthalmitis, and bacterial masses remained imbedded in the tissue despite careful operative technique. Twelve more cases suppurated, combined with sloughing of the sclera that required a secondary excision of the sclera. Ten of these were panophthalmitis, while in the other two the slough was perhaps due to the implantation of too large a pith ball. In 14 cases, a secondary paraffin injection was made into the scleral capsule in the hopes of producing a larger stump.

Before deducing any conclusions from the statistics, it becomes necessary to discuss the advantages and disadvantages of each operation. Enucleation is without question the simpler, and hence more apt to be chosen by the inexperienced operator. Not only this, but the operation can be performed more rapidly so that the patient remains a shorter time upon the table. This, too, lessens the chances of shock, which may occur even in phlegmatic patients under a perfect ganglion anæsthesia. From an economic standpoint, enucleation offers greater advantages, for the patient's stay in the hospital seldom exceeds three to five days and frequently is less. The patient's return to a sphere of useful activity is also hastened, as the prothesis can be fitted usually in less than two weeks. In tumors of the globe, enucleation is, of course, the only procedure to be considered to prevent metastases or an immediate return of the new-growth.

In one other condition has enucleation been considered the only operation to prevent further trouble. That is, traumatic iridocyclitis of that nature that leads to a sympathetic ophthalmia. But it is well known that the operation is futile if performed too late. The question naturally arises: "How long after an enucleation before the patient is no longer in danger

of the development of a sympathetic ophthalmia?" Schirmer (1) agrees with Czermak (2) that fully four weeks must elapse before there is such a positive assurance, although in one authentic case the inflammation developed thirty-two days after enucleation—Snell (3). Other cases with an even greater interval of time have been reported, but their authenticity must be questioned. As example, in a case reported by Mathewson (4), the author himself questions whether or not the inflammation, developing thirty-one days after enucleation, was not an iritis serosa. Not every iridocyclitis developing in a sound eye (even accompanied by the formation of a "Schwarte"), following injury to the fellow eye, can be classed under the heading of sympathetic ophthalmia, unless every other possible etiological factor has been exhausted. The diagnosis of "Sympathetic Ophthalmia" must be made by exclusion, not by inclusion. As illustration, may be cited a case reported by Calhoun (5) that developed an iridocyclitis seven days after iridectomy of the fellow eye. Removal of the operated eye caused no improvement, but complete recovery followed repeated doses of neosalvarsan, despite a negative Wassermann. A luetic iridocyclitis is not necessarily accompanied by a positive complement fixation. Another illustrative case was reported by Elschnig (33). A patient developed an infected iridocyclitis following a senile cataract extraction, which refused to yield to treatment. Five months later, a neuroretinitis appeared in the other eye, but was proven to be due to sphenoidal and ethmoidal suppuration. The inflammation in the second eye clinically resembled a "sympathetic neuroretinitis," but etiologically was proven to be upon an entirely different basis.

The appearance of a sympathetic ophthalmia, late after enucleation, can be understood easily in the light of the Elschnig anaphylactic theory. The absorbed uveal antigens, that are gradually sensibilizing the uvea of the second eye, remain in the blood serum for a considerable period after the source of absorption has been removed. This has been conclusively demonstrated by Hegner with the Aberhalden ninhydrin reaction, and the same author showed that these bodies remained persistent for at least a week after the offending injured eye had been removed.

On the other hand, the operation of enucleation presents several serious disadvantages. There is sometimes an æsthetic or religious objection on the part of the patient toward losing the entire eye, even though the indications for enucleation be absolute. The claim was raised many years ago that total removal of a suppurating eye (panophthalmitis) could and would lead to a spread of the infection cranialwards, *i.e.*, that a meningitis would develop. I shall discuss this question later. Enucleation is not necessarily an absolute prevention against the return of tumors, even though the new-growth has not perforated the sclera. For tumors of the amputated optic nerve have developed not infrequently after enucleation, and in one case at least there appeared a melanotic sarcoma of the nerve stump—Hartman (6).

Unquestionably the nodule remaining in the orbit after an enucleation is smaller and less freely movable than the stump following an evisceration, and unfortunately we are unable to improve the size or motility of this nodule after healing has occurred. Injection into the orbit of any substance as paraffin is dangerous because of the great possibilities of embolism and wandering of the material through the tissues. I use the term "nodule" advisedly. After an enucleation, the union of the conjunctival wound shrinks to a small hard, round nodule, with radiating connective-tissue strands, irrespective of the type of suture used for closing the wound. To this nodule are adherent the ocular muscles, and the motion of the prothesis is due to their traction upon this conjunctival nodule.

Evisceration possesses several advantages over complete removal of the eyeball. Frequently, the æsthetic or religious objections of the patients can be overcome by leaving the scleral capsule within the orbit and removing "only the sick contents of the eye." Hemorrhage is distinctly less. Because of the sclera, which eventually shrinks to a hard lump, the resultant stump is apt to be large and freely movable. Moreover, a small scleral stump can be enlarged within a few days after operation by a secondary injection of paraffin into the capsule. Cosmetically, simple evisceration yields about the same results as enucleation, combined with implantation of fat. This method will be discussed in the next article.

The disadvantages of evisceration are immediate. By that

I mean that the immediate sequelæ of the operation are more unpleasant than those of enucleation, in addition to the fact that the former operation is technically more difficult. The patient, unquestionably, suffers more pain for the succeeding three or four days from the unavoidable orbital and conjunctival œdema. The length of stay in the hospital is usually doubled or trebled, and the prothesis cannot be fitted under four to six weeks. Of course, evisceration is out of the question in tumors of the globe, and, *unless the technique is perfect*, should be avoided in cases of iridocyclitis that could lead to a sympathetic ophthalmia.

Briefly considered, then, enucleation is simpler and easier to perform; economically, saves a great deal of time for the patient; and is more nearly a perfect protection against tumor metastases. On the other hand, exenteration is less of a mental shock; causes less hemorrhage; cosmetically, yields far better results; allows of improvement in the size of the resultant stump; offers less dangers in purulent inflammations; and, if carefully performed, is a safeguard equal to enucleation in preventing sympathetic ophthalmia.

Two points that require discussion at length remain to be considered. In how far does enucleation overshadow evisceration in the prevention of sympathetic ophthalmia? And what greater danger from meningitis does the patient run in the enucleation of a panophthalmitic eye rather than in the evisceration?

If we accept Roemer's theory as to the cause of sympathetic ophthalmia, it is a strain upon the imagination to understand why evisceration or, for that matter, enucleation should prevent the development of the disease. The fanciful organism that is supposed to cause the trouble must be selective in the matter of culture medium in that it will flourish only in uveal tissue. Owing to the physiological lack of continuity of uvea, it must be transmitted from one eye to the other by the circulating blood or lymph streams. If the offending eye (the primary culture) be removed before the circulatory system is invaded, the second eye cannot be attacked. But if the mischief-maker is already in the blood or lymph paths, an outbreak of sympathetic ophthalmia *may* result, *although the organism may have to lie dormant in some unknown recesses for a*

period up to thirty-two days in length. Such behavior is, as yet, unknown among our large number of well-classified and well-studied organisms. Nor is it easy to understand why the organism refuses to attack the sound uvea until at least fourteen days have elapsed from the time of injury. For the histological picture in the offending eye shows exactly the same sort of inflammation as in the second eye [Wagenmann (7)], although the inflammation assumes its characteristics within a few days after injury.

On the other hand, the anaphylactic theory of sympathetic ophthalmia, advocated by Elschnig (8) in 1910, allows of a simple explanation of these facts. Before the disease can appear in the second eye, the entire system must be sensitized by the absorption of broken-down uvea, in the form of antigens, and this requires at least fourteen days to two weeks. After this sensitization has occurred, removal of the source of antigenic absorption has no effect upon the other factors that are the exciting causes of the anaphylactic reaction. This source is the traumatically-inflamed uvea, and it can be removed by enucleation, or equally well by *careful* evisceration. I emphasize careful, for remnants of choroidal tissue left within the scleral capsule are antra for antigenic absorption that can easily lead to a sympathetic ophthalmia. Snellen (9) reported two cases of sympathetic ophthalmia that followed evisceration, and in both eviscerated stumps he found microscopic evidences of inflamed uvea. Schieck (10) reported such a case with the histological findings of a mononuclear infiltration of small choroidal rests in the eviscerated stump. A similar case occurred in my own practice (11). Various authors have published cases of sympathetic ophthalmia developing months to years after a Mules operation, and tend to ascribe it to irritation by the implanted ball. Brobst (12), Limbourg (13), Campbell (14), Oliver (15) reported such a case and examined the stump histologically. He found a mononuclear infiltration and a wide dispersion of the leucocytes and was consequently led to the belief that sympathetic ophthalmia is not a bacterial disease. A similar case was published by Gifford (16) who collected from the literature 27 cases of sympathetic ophthalmia developing after evisceration, but nearly all without examination of the offending

stump. There is no doubt but that all of these cases, if carefully examined, would show choroidal remnants within the scleral capsule, the source of antigenic absorption. Goldzieher (17 and 18), however, is even more radical in his views than the majority of authors. In impending sympathetic ophthalmia, he claims to have found an infiltration of the sheaths of the ciliary nerves, a peri- and an interstitial-neuritis, and believes that the disease is transferred from the first to the second eye along these paths. As a preventive measure, he insists upon exenteration of the *orbit*; it is scarcely necessary to comment upon this proposition.

Enucleation, *if performed in time*, is a positive prevention of sympathetic trouble. But how many cases of sympathetic ophthalmia occur where the enucleation has been performed too late? The majority of cases of this disease are due to this factor, and a reference to the literature is not even necessary. Thus the question resolves itself into not "what is the operation of choice," but rather "when must the operation be performed?" For the majority of the cases reported of sympathetic ophthalmia developing after evisceration have been found to be due to choroidal remnants in the eviscerated capsule.

The second question as to whether enucleation of a panophthalmitic eye is liable to result in meningitis is still a bone of contention among various authors. von Graefe (19) in 1863 was the first to report such an occurrence, and since his original communication 63 cases with fatal termination have been recorded in the literature. The Brueckner-Deutschmann report (20) contained 26 cases occurring up to 1885, and within the next three years Becker (21) was able to collect 17 more. Individual cases were added by Ramm (22), Kalt (23), Risley (24), Enslin-Kuwahara (25), and others. Fifty-eight cases were collected and studied by Kantorowitsch (26), who included 118 cases of enucleation performed in the Haab clinic in her report. She concluded that enucleation was a safe operation unless the panophthalmitis were of the intensely virulent type. Darrieux (27) enucleated in 42 cases of panophthalmitis with three resultant deaths; but in none of them did autopsy reveal any lesions along the course of the optic nerve or in the chiasm, although isolated patches of meningitis

were present in two of them. Basing his conclusions upon these experiences, he was not willing to acknowledge that enucleation of a purulent eyeball increased the possibilities of the development of a fatal meningitis. On the other hand, Jacqueau (28) reported a case of panophthalmitis that was enucleated under a general anæsthesia, with the result that a serous meningitis developed and proved fatal on the fifth day. Autopsy was performed upon 11 of the fatal cases reported by Becker (29), and in nine of them no pathological changes were found along the course of the optic nerves or in the chiasms. An exceedingly instructive case, and one that tends to support the views to be expressed later, was detailed by Stevenson and Adair Dighton (30). An eye, destroyed by a pneumococcic infection, was enucleated. Death resulted four days later from meningitis. At autopsy the optic nerve and chiasm were found to be devoid of any pathological changes. The exudate from the meningeal inflammation contained a very few isolated pneumococci of low virulence and a large number of active ray fungi. The source of these latter was traced to an old infected sphenoidal cavity that was filled with pus from an actinomycotic infection.

The development of a fatal meningitis following the enucleation of a panophthalmitic eye is an old saga that has been accepted by the majority without question, though but few have investigated the why and wherefore. Such an infection must have one of three sources: from the suppurating eye and subsequent transmission along the optic nerve or its sheaths or especially along the orbital veins (as a septic thrombophlebitis) to the meninges; from an infection implanted during the operation and transmitted along the same paths as in the first case; or from a purulent focus elsewhere in the body, as a suppurating joint or prostate, and infection of the meninges by metastasis.

I have not been able to find a single case in the literature of proven passage of infectious material, extra-vascularly, through any of the optic channels. In all of the autopsy reports that have been at my disposal, have the optic nerves and chiasms been shown to be uninfected. Randolph (31) admits the possibility of such a transmission, but believes it to be exceedingly rare, basing his views upon animal experiments.

Nevertheless, he advises enucleation only in exceptional cases, so strong is the hold of von Graefe's teaching. Transmission of the infecting organisms through the orbital vessels, particularly the veins, may and does occur, but probably owing to a direct infection of the vessel walls, intraocularly, ***before the operation takes place.*** Consequently it is not probable that in such cases evisceration would be more of a preventive measure than simple enucleation.

Infection from operative procedures is, in this day and age, fortunately a rare occurrence. In Becker's report (32), there were two cases of non-infectious ocular trouble that unquestionably came under this heading. It is impossible, however, to estimate its frequency, and a discussion of this phase of the question is here out of place.

In dealing with a metastatic panophthalmitis we cannot be justified in attributing a subsequent meningitis to operative interference, unless a direct path of infection through the orbit can be demonstrated. For it is well-known that metastases of purulent processes to the meninges are of frequent occurrence, irrespective of extraneous influences.

Based upon these facts, it is not justifiable to assume that enucleating an eye suffering from panophthalmitis (in the sense employed by Fischer and Von Arlt) is dangerous to the life of the patient in that a fatal meningitis will result. But, lacking positive evidence to the contrary, it is advisable to eviscerate the eyeball in the presence of an intensely purulent panophthalmitis.

CONCLUSIONS: There can never be any absolute indications formulated as to when to enucleate or when to eviscerate an offending eyeball.

But, with the previously mentioned factors in view, evisceration may be performed in all cases except those of malignant growth and phthisis bulbi, provided care be taken that no choroidal remnants remain adherent to the scleral capsule.

On the other hand, enucleation may be performed in all cases with the possible exception of very virulent panophthalmitis.

From an economic standpoint, enucleation is to be preferred when possible; but from a cosmetic viewpoint, evisceration is the operation of choice.

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EPIBULBAR SARCOMA, WITH MICROSCOPIC AND MACROSCOPIC SECTIONS.[1]

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(*With one drawing in text and three photographs on Text-Plate I.*)

THE comparative infrequency of sarcomata in this location, and the wide variance of opinion as regards their malignancy, prompt me to report the following case, together with a résumé, of some of the most important contributions on the subject up to the present time.

Mrs. Freda Meissner, age 74, was first seen by me at the Manhattan Eye, Ear, and Throat Hospital on April 6, 1914; family history negative; aside from a tumor of the left breast, which was removed 25 years ago, her general health has always been good. Two years ago she had trouble with the left eye, the nature of which she did not understand; the physician whom she consulted treated the eye with bluestone for some time, and the eye finally became quiet, and treatment was discontinued. It gave no further trouble until October, 1913, when the eye became red and painful. About January 1, 1914, she noticed a small black spot at the outer margin of the cornea, in the horizontal meridian, which began to grow quite rapidly, and progressed in size until the case came under my observation.

On inspection the right eye appeared normal; the left presented a small black tumorous mass, situated between the insertion of the external rectus muscle and the corneal margin. There was a triangular area of slight pigmentation in the conjunctiva, the base of which coincided with the margin of the tumor, the apex extending upward and outward.

[1] Read before the Section on Ophthalmology of the N. Y. Acad. of Med., May 18, 1914.

There was no evidence of old trachoma present. The tumor proper measured about 8*mm* in its horizontal, and about 5*mm* in its vertical, diameter. It was slightly constricted at its base. The superficial layers of the cornea appeared to be slightly elevated where the tumor encroached upon it. The attached portion of the tumor seemed to adhere closely to the limbus and adjacent episcleral tissues. The portion of the tumor external to the constriction was removed for pathological examination. The condition of the eye at this time, aside from the tumor, was as follows: Cornea and aqueous chamber normal; lens beginning cataractous; floating opacities in vitreous; the fundus, however, could be distinctly seen and appeared normal; vision with correction was $\frac{20}{30}$; transillumination clear except over insertion of external rectus muscle, in which no light penetrated the globe. Pupil reacted both to light and to accommodation. There was a slight contraction in the upper nasal field.

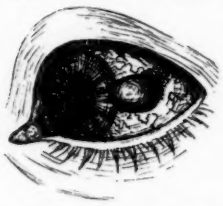

FIG. 1.—Pen Sketch showing location of tumor.

Examination of the tumor under the microscope showed it to be a mixed-celled melanotic sarcoma. The patient was informed as to the nature of the growth, and advised to have the eye removed at once, to prevent further extension. She reluctantly consented. The eye was enucleated on the 17th of April, the triangular area of conjunctival pigmentation being removed with it. The process of hardening the eye was at once begun, and the mounted sections, here presented, reveal the nature and extent of the growth.

Section of the Eye: The cornea is normal throughout, except at one limbus, where is a local swelling of the corneal epithelial layer, which also shows considerable breaking up of the cellular layer. There are several circular bodies which are made up of corneal epithelial cells.

Bowman's membrane is broken through by the tumor cells, where they are extending into the stroma layer. There is considerable swelling of the bulbar conjunctiva and Tenon's capsule, and some cellular invasion extending back on to the sclera. The new-tissue formation is almost entirely composed of cells having little or no intercellular substance, with quite a little pigment formation.

ILLUSTRATING DR. CRIGLER'S ARTICLE ON EPIBULBAR SARCOMA, WITH MICROSCOPIC AND MACROSCOPIC SECTIONS

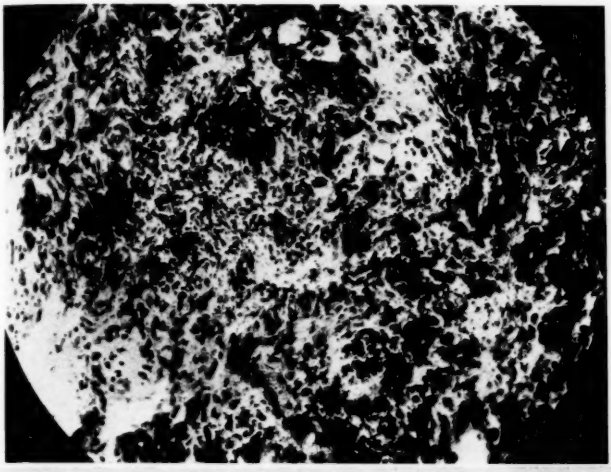

FIG. 2.—Greatly enlarged section of tumor showing marked pigmentation.

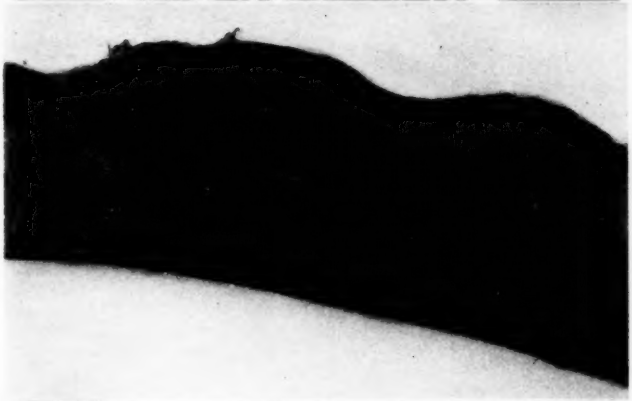

FIG. 3.—Horizontal section of eye through tumor. Magnification 35 diameters.

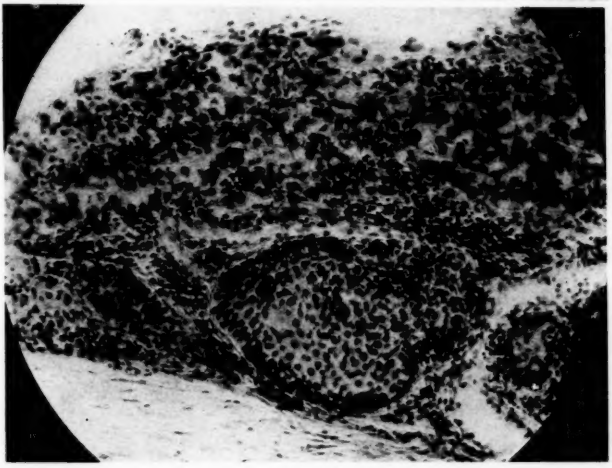

FIG. 4.—Same as Fig. 3. Magnified to 125 diameters.

The sarcoma cells are rather few over the position of the primary tumor growth. There are a great many round cells in this position. It would seem that the first operation removed the tumor formation almost entirely.

THE TUMOR.

The Capsule: The outer two-thirds of the tumor is partially encapsulated by the remnants of corneal epithelial cells and conjunctival tissue.

The Blood-Vessels: There are a number of small blood-vessels within complete vessel walls. There is considerable free hemorrhage into the tumor growth.

The Pigment: There is considerable free granular and cellular pigment formation. This is undoubtedly autochthonous in its origin and not from the hemorrhage.

The Cells: There are a great number of large round sarcoma cells and a number of these cells show double nuclei. There are also many large spindle cells throughout the growth. A rapid cell division is taking place, showing many small round sarcomata cells. This growth should be considered as a mixed cellular one, *i. e.*, large and small round and spindle, with quite a high degree of pigmentation.

Diagnosis: Melanotic epibulbar sarcoma.

In reviewing the literature on the subject, one is at once impressed with the rarity of such tumors.

Verhoeff and Loring, in 1903, made an exhaustive study of this subject, and their report up to that time embraced practically all of the cases that had been previously reported.

"Holmes was reported to have found, in 1878, three cases of sarcoma of the conjunctiva among 20,000 eye cases; Adamuck, three in 16,000; and Verhoeff and Loring themselves, at the Massachusetts Charitable Eye and Ear Infirmary, two epibulbar sarcomata in 44,719 eye cases."

My own examination of the records of the Manhattan Eye, Ear, and Throat Hospital reveals only four epibulbar sarcomata out of a total of 100 tumors of the conjunctiva, the number of other conjunctival affections being over 100,000.

The tendency of these tumors is not to penetrate the globe, but to recur locally when removed, and to produce metastases when not dealt with in a radical manner.

Of the 73 reported cases, examined by Verhoeff and Loring, in 1903, only five showed intraocular involvement. Of the 12 more recently reported cases examined by myself since then, none showed intraocular involvement; when this does occur, it is along the perforating anterior ciliary vessels. The cornea is practically immune to the development of sarcomata, although Rumschewitch and Semple and Villard report two involving the cornea alone. The exposed portion of the limbus is, as a rule, the site of development of these tumors, more often at the outer margin of the cornea. It is here that one often observes a dark pigmentation, especially in brunettes. In a certain percentage of cases, these tumors originate in this pigmented substance. Traumatism and prolonged irritation are thought to act as exciting factors in the cell proliferation.

The majority of cases occur in persons of advanced years, although Fromagat reports a case of embryological development, which revealed a distinct tumor formation at the third month of life, but showed no proliferation until the fifth year. These tumors are, as a rule, melanotic, the ratio of pigmented to non-pigmented being about as 6 to 1.

The statistics of Verhoeff and Loring are very convincing, and prove beyond doubt that epibulbar sarcomata should be dealt with as radically as sarcomata in any other part of the body. In substantiation of this claim the following statistics are given:

Of the 73 published cases, 53 were treated by primary abscission.

No recurrence after six months' observation	1	
" " " one year's "	4	
" " " two years' "	1	
" " " several years' "	2	8
Recurrences within one year's "	10	
" " two years' "	3	
" " several years' "	4	
" exact time not stated	19	36
Not followed after operation,		9

Among the above 36 cases in which recurrences were observed, the following bad results were noted:

1. Recurrence with preauricular gland. Death in four years from general metastases.

2. Within three years, enucleation, general metastases, and death.

3. Recurrence with preauricular gland in two and one half years; exenteration of orbit and death from supposed metastases.

4. Preauricular gland and invasion of interior of eye.

5. Recurrence in orbit and parotid region.

6. Metastatic tumors on cheek and later on body generally.

7. After several abscissions preauricular gland.

8. Finally enucleation followed by recurrence in lids and orbit.

9. Recurrence in lids and orbit; enucleation and exenteration.

10. Recurrence in lid from implantation.

11. Enucleation and recurrence.

12. Recurrence in lids and doubtful tumor in abdomen.

In reviewing the literature subsequent to the publishing of the above report, the writer has collected reports of twelve other cases, which are here briefly given:

1. La Fon—A man, 35 years of age, developed a red spot at vertical portion of limbus, slightly invading the cornea, but tissue of cornea remained normal. Removed, with rapid healing. Recurrence in 18 months; no further report.

2. Jessup—E. J. G., age 36. Sarcoma at limbus on temporal side. November 10th removed; examination showed spindle-cell sarcoma. November 17th, recurrence in situ. Thought might have come from mole.

3. Benson and Mooney—Patient, age 40; tumor at limbus, temporal side, left eye; black, size of split pea. Removed and surface cauterized. Pathological report: small spindle-cell sarcoma.

4. Tweedy—Sarcoma of conjunctiva size of pinhead. Remained stationary for twenty years; removed, and within six months it recurred. Orbit exenterated, followed by metastases, and death in two years.

5. Ray—Voluminous sarcoma of the bulbar palpebral conjunctiva: Child, 6 years old; large tumor springing from upper portion of limbus of right eye; non-pigmented. Microscopic examination showed round-cell sarcoma. Growth rapid; orbit exenterated. No recurrence after ten months.

6. Schwenk—Case Edna N., age 15. Red spot on right eyeball, several years, 4*mm* to outer side of limbus; removed; recovery; no recurrence; specimen examined showed small round-cell sarcoma.

7. Lauber—Diffuse melanotic sarcoma of conjunctiva. Man, iron worker, age 44, got hot metal in eye; black specks followed and slowly increased. Examination showed whole of conjunctiva of lids and ball one black mass; interior of eye normal. Orbit exenterated; recovery; no further history given.

8. Veasey—W. B., age 47; small brown spot, temporal side of corneo-scleral junction, for twelve years; never given trouble until recently, then grew rapidly for seven weeks. Enucleation; no recurrence up to date—one year.

9. Sharp—Colored girl, age 8. Tumor left eye, pedunculated; removed; examined and pronounced sarcoma; no recurrence after four years.

10. Bell—Tumor at outer limbus of left eye, noticed by patient as small black spot six years ago. At time of examination, it measured 6*mm* wide, 10*mm* long, and was elevated about 3*mm* above the surface of the eyeball. Paralysis of external rectus muscle. Enucleated; examination showed it to be an alveolar melanotic sarcoma. No recurrence after one year.

11. Gruening—Small black tumor removed from outer side of left cornea. Two removals with two recurrences; enucleation; recurrence in scar in three months. Scar excised; recurrence in four weeks. Exenteration; no recurrence up to time of report.

12. Semple and Villard—Sarcoma Primitiva della Cornea. Patient, age 65; right eye red, and painful for several years; associated with pannus. Epithelioma lower lip; removed; noticed small red excrescence on right cornea several weeks previously. Examination revealed this growth on the cornea near the limbus, but independent of it.

Symptoms relieved by treatment and patient not seen for four years, when the eye became inflamed and painful again. Cauterization of the growth was followed by recurrence, three times in succession. It now extended over entire cornea. Patient lost track of, while tumor continued to grow slowly, but did not encroach on the conjunctiva.

Eye removed; no recurrence. Examination of the eye showed no pathological disturbance outside of the cornea. The superficial layers of the cornea were intensely infiltrated in places down to Descemet's membrane. The tissue formation was that of a non-pigmented plexiform fibrosarcoma. No local recurrence of the affection after fifteen months, but a recurrence of the epithelioma of the lower

lip, followed by a second removal, with extension, and involvement of the preauricular glands.

It will be seen that the results in these cases substantiate the opinions already expressed: that sarcoma situated on the conjunctiva are essentially as malignant as those situated upon any other exposed surface of the body. That they are not as fatal, can be easily explained by the fact that they are discovered in their incipiency, are situated over the highly resistent sclera, and in close proximity to the non-vascular cornea, so that drainage from the tumor takes place in only one direction.

It should here be briefly stated, that small pigmented tumors, situated wholly within the conjunctiva, and freely movable, showing no tendency to cell proliferation, should not be classified as sarcomata, and hence not dealt with in so radical a manner.

The writer is indebted to Dr. A. Braun for the pen sketch, to Dr. George S. Dixon for the microphotographs, and to Dr. W. B. Weidler for the microscopical reports.

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REPORT OF TWO CASES SHOWING THE EFFECT OF SYPHILIS ON INJURY OF THE EYE.

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FOR years we have all more or less recognized the action of syphilis in injuries to other parts of the body, but my attention has recently been called to its effect in injuries of the eye, having two cases in which it was not diagnosed at the time of the injury, and which showed in a very marked way that it is one of the causes of trouble frequently overlooked.

Case 1.—American, aged 25; referred to me on November 25, 1912, from one of the mining camps in Arizona, giving the following history: First noticed trouble with the right eye twelve days ago; had some rock thrown in the eye while working, and shortly after noticed pain; was examined by the local doctor, who could find nothing in the eye to account for the trouble; pain continued, and on the fifth day the physician removed a small piece of rock from the right eye. The pain continued, the eye became very much inflamed, the pain increasing up to the time he came to me, being unable for the last few nights to sleep. Examination of the eye showed marked congestion over the bulbar conjunctiva; ciliary injection; cornea slightly cloudy; pupil slightly dilated, presumably by atropine. In the anterior chamber there was a hypopyon, starting from the nasal side at the angle of the anterior chamber, extending to mid-pupillary distance, being surrounded at its extremity by a very thin membrane, which extended about two millimeters farther in each direction. All of it slightly gray in color. The hypopyon was almond-shaped, well-rounded surface above, apparently slightly flattened on the iris side. Below this, about halfway between the origin of the hypopyon and the lower median line, at mid-distance between the root

of the iris and the pupillary edge, were two small reddish-yellow, slightly elevated spots, about two millimeters in diameter; keratitis punctata on the posterior corneal surface. He gave a history of always having been in good health; no cough; operation for hemorrhoids four or five months ago; chancroid infection six months ago, which was treated by a reputable physician, who at the time told him there was no possibility of luetic infection; never had a sore throat; does not remember ever having an eruption. A tentative diagnosis of papular syphilide was made, which was confirmed by a positive Wassermann. On November 26th, he was started on hypodermic injections of $\frac{1}{4}$ gr. of succinimide of mercury and instillations of atropine; this treatment being continued for ten days. On the third day the pain had decreased in the eye; on the fourth day, the pain was entirely absent and the hypopyon was markedly shrunken; on the eighth day the hypopyon had entirely disappeared, with the exception of a small particle, which had dropped off the tip into the bottom of the anterior chamber; the pupil dilated; the vision was markedly improved. At the root of the iris could be seen a slight elevation, undoubtedly a large papular syphilide, which was the source of the hypopyon. The two small papular syphilides had entirely disappeared; pupil dilated regularly, and no synechia. He was referred back to the general physician for further treatment for his constitutional trouble.

This case was important, first, from the medico-legal aspect. The injury which he claimed, having been received in the course of his work, might have been the cause of a suit for damage. It is interesting from another standpoint, as Fuchs says that papular syphilides never occur in the mid-region between the root of the iris and the pupillary margin, always occurring in one of the two latter places. He also makes the statement that they never break down or suppurate, which was noticeable in this case.

CASE 2.—Mexican, aged 60; referred to the Charity Eye Clinic, with senile cataract in both eyes, giving previous history of fairly good health, but claiming an attack of pain in the back of his neck, seemed to think with loss of consciousness, which, in a patient of this type, may mean almost anything. The case was an extremely hard one to

operate, the patient being unable to move his eyes in the direction required. He was trained three times a week for two months, never in that time acquiring the ability to look down on direction. The eyes were deeply sunken in their orbits; the cataract knife being placed across the eye from the lateral orbital rim did not touch the cornea. He was operated March 1, 1913, the cataractous lens successfully removed, the iris replaced, and up to the tenth day the eye was apparently doing nicely. On the twelfth day after the operation, there developed iridocyclitis, which we were unable to control with ordinary remedies. The eye grew steadily worse, the pupil became fixed and filled with an exudate, hemorrhage in the anterior chamber, the patient during all this time suffering severe pain. On March 24th, having failed in other means of diagnosis, a Wassermann was done, which was positive. He was immediately given a full dose of salvarsan, which relieved the pain within two days, with complete absorption of the blood and exudate within ten days, but left the pupil completely drawn up toward the corneal wound and occluded. Anti-syphilitic treatment of mercury and iodide of potassium was continued for four or five months, when an operation was done and an artificial pupil made, giving him vision enough to move about without difficulty. He was under treatment for a year and a half, when a Wassermann was done; being found negative, his right eye was operated on with complete success.

To the physicians in this part of the country, who are doing charity work among the poor class of Mexicans, this case is significant, as we have always felt that lues was liable to complicate any trouble they might have. Since that time I have added the Wassermann examination to the other tests before operating for cataract on people of this class. An interesting feature in connection with cases of this kind is a report I have had made through the kindness of Dr. Paul Gallagher, of the Medical Clinic, and Dr. Willis W. Waite, of the Crouse Laboratories. Blood was taken from fifty indiscriminate clinical cases, all Mexican, only one of whom showed a typical lesion. Nine others were suspected, possibly more because of their race and social standing than for any clinical reason. I herewith attach report, showing the sex and age of those examined, with the percentage of positives:

Male.			Female.		
Age.	No. Examined.	%	Age.	No. Examined.	%
Under 20	1	100%	Under 20	4	50%
20–30	8	50%	20–30	14	79%
30–40	3	66%	30–40	5	40%
Over 40	8	75%	Over 40	7	70%
Total and Average	20	65%	Total and Average	30	66%

While the number examined is not sufficient to prove conclusively that the percentage of positives remains constantly uniform, it is sufficiently large to show that the question of syphilitic infection may be a source of a great deal of trouble and complication in injuries to the eye of this class of people. A significant fact in the percentage column is that of 20 males 65 % were positive; in 30 females, 66 % were positive.

ON DECOMPRESSION OPERATIONS IN DISEASES OF THE OPTIC NERVES.

By Prof. A. BEDNARSKI.

(From the Ophthalmic Division of the Sophien-Kinderspital in Lemberg.)

Translated from *Archiv f. Augenheilkunde*, Vol. LXXII., 1912.

DURING the past year I had the opportunity of suggesting a decompression operation in six children from my service in the Sophien-Spital. In five of these the callosal puncture after Anton-Bramann was performed; in one, in addition, a trephining and in another a number of lumbar punctures.

Case 1.—S. D., 6 years old, states that her sight has been failing for one year. On March 24, 1911, the right eye could perceive hand movements, the left saw fingers in 3½*m*. The pupils are moderately dilated, of the same size, react promptly to light. The frontal and parietal sutures are thickened and distended. The coronary suture is somewhat depressed. The skull is short, high, asymmetrical, and presents a low degree of oxycephalia. The frontal eminences are approximated to one another. The region of the greater fontanelle is bulging. The orbital cavities are deeper than normally. The teeth show rachitic changes. The optic disks are unusually pale, right more than left, with sharply defined margins. The retinal arteries are narrow.

Diagnosis: Rotatory nystagmus, divergent strabismus, post-neuritic optic atrophy with oxycephalia.

On April 7, 1911, the callosal puncture was performed by Professor Schramm. A little blood-stained fluid was obtained. April 10th, the right eye could count fingers. April 14th, the right eye, fingers in ½*m*; left eye, fingers in 3½*m*. The child is livelier and has a more friendly expression than before the operation. April 28th, right, fingers, ½*m*; left,

fingers, 5*m*. The visual field has contracted, the wound in the skull is cicatrized, and no defect in the bone can be palpated. The subsequent course is uneventful. The improvement in vision persisted during the entire period of observation, which was six months. October 20, 1911, right, fingers, ½*m*; left, fingers, in 5*m*. The visual field is very much contracted.

Without wishing to discuss the cause of optic atrophy in defects of the cranium, I would like to correct the statement of Uhthoff who mentions me among the authors that regard a basal meningitis as the cause of an optic atrophy. In 1908 I published a number of cases of asymmetry of the skull with optic atrophy, and emphasized the internal hydrocephalus as the cause for the optic-nerve condition. In Nagel's Annual Report my paper is abstracted as follows: "The author believes that the atrophy of the optic nerves developed from the internal hydrocephalus (the serous meningitis) though in some cases a simple chronic meningitis may have caused the atrophy."

Formerly these cases were treated with medicines. The prognosis in the least marked of these cases was consequently doubtful. In this case which has just been described, blindness would probably have resulted after the course of a few years. The positive result of the operation shows that the cause for the neuritic atrophy of the optic nerve is to be found in the increase of the intracranial pressure. In this case, notwithstanding the advanced atrophy with decided reduction of the vision, sight improved immediately after operation, in the right eye to fingers in ½*m*, and in the left eye to fingers in 5*m*, and this improvement remained during the period of observation.

Similarly operated upon cases have only occasionally been reported in literature. In 1908 Dorfmann reported a case of trephining in a girl four years of age, with a tower skull and choked disk. The child suffered from severe headache. Three weeks later the vision had improved in the right eye from $\frac{3}{30}$ to $\frac{6}{20}$; in the left eye from $\frac{6}{60}$ to $\frac{6}{24}$. The prominence of the disks was reduced by 1 D.

In 1909 Anton published a case of a man 30 years of age, with a tower skull, in whom the callosal puncture had been

performed. The sight improved in the right eye from $\frac{1}{3}$ to $\frac{2}{3}$; in the left eye there was no improvement. Headache and attacks of vertigo disappeared.

In recent years Meltzer, Falta, Natanson, Vorschutz, Bullinger, and others have reported favorable results after operations in these cases (craniectomy, trephining, ventricular puncture, callosal puncture, lumbar puncture).

CASE 2.—M. K., 9 years old, suffered last year from illness with fever, headache, and vomiting. The headache continued, especially on the left side. Sight has become affected for four weeks and patient is entirely blind for the last week. There is involuntary evacuation of feces.

On examination the right eye cannot be closed. Both eyes are turned somewhat toward the left. Movements of the eyes to the right are restricted, especially the right eye. The pupils are dilated, left more than right, and do not react to light. No p. l. Bilateral choked disk, elevation of 3 to 4 D.

Physical examination showed general pallor, scoliosis, and enlargement of the inframaxillary lymph glands. Urine normal, Pirquet positive. Some indication of a right facial paralysis. Cracked-pot sound on percussion of the skull. The left corneal reflex abolished, the right is weak. The tongue is deviated to the left. Slight rigidity of neck; no ataxia. General tremor on standing. Reflexes normal.

Diagnosis: Bilateral choked disk, paralysis of right facial nerve, suggest a brain tumor, probably a tuberculous growth.

April 14, 1911, a decompressive trephining was performed. An oval piece of bone was removed on the right side of the skull; the dura was not opened.

April 21st. No improvement.

April 24th. Convulsions with coma.

April 25th. Vertigo.

May 1st. Convulsions have repeated themselves every day.

May 2d. Callosal puncture. The dura was also exposed by the same cutaneous incision. 1 to 1½*ccm* clear blood-stained fluid was evacuated and the dura was then sutured.

May 6th. No further convulsion.

May 11th. The swelling of the disks has diminished.

May 12th. Paralysis of the left upper extremity.

May 16th. Cerebral prolapse.

June 17th. Death. Autopsy report: Conglomerate tubercle of the right half of the cerebellum, with circum-

scribed encephalomalacia. Chronic internal hydrocephalus. Tuberculous adenitis. Pleurisy. Tubercular changes in the kidney, intestines, vertebral column. The growth of the cerebellum was the size of a hen's egg.

In this case trephining did not improve the condition of the patient. On the contrary, convulsions and vertigo set in. These were relieved by the puncture but the symptoms associated with the brain tumor became more pronounced.

CASE 3.—S. B., 11 months old. The patient does not see. The head is distinctly that of a hydrocephalus. It measures 46½*cm*, with distended cranial bones, large fontanels, and separated sutures. The large fontanel measures 6*cm* in diameter. The pupils are large and do not react. The eye grounds are normal.

Diagnosis: Amblyopia; congenital chronic hydrocephalus.

March 1st and 4th two lumbar punctures were performed without any result, as only blood was aspirated.

A callosal puncture was to have been undertaken, but the child left the hospital. It returned in May with the same symptoms and the head has even become larger. A general examination shows no distinct rachitic symptoms. There is no rigidity of neck. The child is now 14 months old and cannot stand on its legs, cannot sit up nor support its head. Pulse rate 88. On passive motion there is some rigidity of the knee joints. Knee jerks active and the large toe is antiflexed. Ankle clonus distinct.

Callosal puncture was performed May 13th. As the bones are very thin, the oval opening was cut out with the scissors. May 15th the child is bright and directs its eyes toward objects which are held before him, and is interested in everything that is going on. The pupils react to light. There is no change in the general condition. The improvement in sight persisted for only two weeks.

February 10, 1912. A relative of the child reports that the child is alive, intelligent, healthy, is able to talk and sing, but cannot walk nor sit up nor support its head. The child is able to see somewhat, for it fixes with its eyes and aims to grasp objects which are held before it.

It is possible to obtain a permanent improvement in these severe cases, unless the patient has a bad heredity. This is proven by the case reported by Starck in the *Münch. med. Wochenschr.*, 1909, page 105, of which the following is an abstract:

M. B. at the beginning of its second year was ill with fever for several weeks, with severe meningeal symptoms. The head became very large. She could not see nor could she raise herself. Eight months later the patient was admitted to the Children's Hospital, where it was found that she was well nourished, of normal size. The asymmetrical skull was enormous, measuring 51*cm.* The frontal bosses prominent, the parietal bone bulging, the head very heavy. The patient is generally in a good mood, lies quietly on her back. The arms and legs can be moved, but cannot sit or stand or support its head. It is difficult to determine whether the patient hears or sees. The pupils are dilated. She does not fix. The optic nerves are somewhat pale. *Diagnosis:* As there is no optic-nerve atrophy, the blindness is presumed to be cerebral. The patient does not talk; no spasms; knee jerks accentuated; eats well. The spinal fluid on lumbar puncture shows increased pressure. It is clear and contains a few lymphocytes. This puncture was repeated ten times and was well borne by the child. On the following day, or after two or three days, there was a rise in temperature up to 40° C. after the puncture. After the fourth puncture there was distinct improvement in vision. Bright objects were followed by the eyes. Two years later the child can hardly be recognized, though the head is still very large, 53.5*cm* in circumference, with the chest measurement of 47; but the child is able to sit up, looks around in an animated way, talks a great deal, and seems mentally normal. According to Starck, the lumbar punctures were here of avail because the condition was one of a secondary hydrocephalus following an acute cerebral inflammation.

Case 4.—S. P., 4 months old, has lost his sight for four weeks. The parents were related. The mother states that the first child was lost through a miscarriage, the second was born dead, and the third is healthy. The eyes are usually directed downward, oscillate, and perform slow rotations. The left pupil is larger than the right. There is no reaction to light. Eye grounds normal. The circumference of the head is 41.3*cm*, chest circumference 38*cm*. The large fontanel is 2¼*cm* broad. Knee jerks normal.

Diagnosis: Amaurosis, rotary nystagmus, congenital internal chronic hydrocephalus.

After the first lumbar puncture there was no improvement. After the second, the eyes are not directed down as much and the motion of the eye is less. Pupils uniform. The child does not see. The optic disks are somewhat paler.

November 11, 1911, the patient has had ten inunctions with mercurial ointment. The child is now 10 months and

is well developed. The large fontanel is raised when the child cries, otherwise it is somewhat depressed. The head circumference is 44.5*cm*. The child is able to stand and sit up. The pupils are uniform and the eyes are quiet. The optic disks are sharply defined, though somewhat paler.

May 16, 1912. The child keeps its eyes pressed together and does not fix. Divergent strabismus. Occasional nystagmus. No reaction to light. The general examination showed signs of rickets; the orbital glands are enlarged. The large fontanel is very small, about 1*cm* in diameter. The head circumference is 45*cm*, the chest measures 43.5. Chvostek negative. The pulse rate is 100. No rigidity of knee or joints. It is not possible to determine the presence of knee or ankle reflexes. The child is happy and plays. The Pirquet and Wassermann reactions are negative.

May 31st. The callosal puncture is performed and a clear fluid evacuated under considerable pressure.

June 1st, the child does not see. The oscillations of the eye have increased.

June 7th, no return of sight. The eyes, however, are kept open better. The right eye is deviated outward, the left is directed upwards. No nystagmus.

July 4th, no change.

September 29th, the general condition of the child is good. There is no nystagmus, though the child turns its eyes about like a blind person. Pupils are moderately dilated and do not react. The disks are pale.

This is probably a complicated case. The obvious history suggests syphilis. The relationship of the parents speaks for the congenital cause of the amblyopia. The disturbances of position and motility of the eyes suggested increased intracranial pressure and decided me to suggest an operation, as lumbar puncture did not produce any improvement. At operation the cerebral and spinal fluid escaped under pressure and after the operation there was an improvement in the position of the eyes. This is probably a case of congenital amblyopia.

Case 5.—S. R., 8 years old. Her father died from tuberculosis. In September, 1910, the child was taken ill with severe headache which continued until May, 1911, and was frequently accompanied by vomiting. Numerous skin abscesses developed. During the winter of 1911 the child was treated for gastritis, and a physician recognized meningeal symptoms. May, 1911, the headache diminished but the sight began to fail.

June 16, 1911, the pupils are moderately dilated, uniform, react promptly. Alternating divergent strabismus. Corneal reflex preserved. Right eye $\frac{5}{30}$—$\frac{5}{20}$; left counts fingers. The field of the right eye is contracted to 15° up, down, and in; 35° out. The disks are unusually pale and not defined, the retinal vessels somewhat narrow. There are no signs of choking.

The general condition of the child shows that she has suffered from rickets. There are enlarged glands in the neck and scars in the right hand; the head is enlarged to 52.5*cm;* the chest measures 58.5*cm.* The skull is of rachitic shape with dilated frontal veins. A cracked-pot sound is elicited on percussion over the left side of the skull. The right nasolabial fold is not pronounced; the right upper extremity shows exaggerated reflexes. Knee jerks normal. Babinski negative; Chvostek positive but weak. Abdominal reflex on the right side stronger than on the left. No fever. Pirquet positive; Wassermann negative.

Diagnosis: Neuritic optic atrophy, acquired internal hydrocephalus.

Though the sight has failed for only a few weeks, the fundus examination shows that an inflammation of the optic nerves must have existed for a long time. The general condition of the child is good and a decompression operation is recommended only on account of the diminution in sight.

June 24, 1911, the callosal puncture was attempted. On incising the dura there was so copious a hemorrhage that the operation had to be postponed.

June 30th the patient complains of vertigo and vomits. July 28th no improvement in sight. July 29th, the callosal puncture was attempted on the other side, with success.

August 2d, left counts fingers at 1*m.*

August 8th, right $\frac{5}{15}$, left fingers 1½*m.* The fields are unchanged. On percussing the skull, a similar note is elicited in all places. The nasolabial folds are equally marked.

September 19th. The patient no longer suffers from headache and has not vomited. She is much quieter and seems normal. Vision, right eye, $\frac{5}{15}$ to $\frac{5}{10}$; left, fingers at 4*m.* The disks are very pale; the margins are undefined; there is no œdema and no inflammatory symptoms. There is, in other words, no change in the ophthalmoscopic picture, The field is enlarged in both eyes. Right 30° up, 35° down. 70° out, 60° in. Left 25° up, 30° below, 40° out, and 20° in.

This is a case of acquired hydrocephalus following a meningeal process. The vision improved after operation from

$\frac{5}{50}$ to $\frac{5}{10}$ in the right eye; in the left eye from movements of hand to counting fingers to 4*m*, notwithstanding that the optic atrophy was pronounced in both eyes. The headache disappeared.

Similar cases have been reported by Bramann, Orzechowski, and Rydygier, Jr. (callosal puncture), Halben (Payer's operation), Dubarry and Guillot, Velter and Chauvet (decompressive trephining), and others.

In the case of Bramann, a tuberculous child, aged 7, with progressive hydrocephalus, circumference 54½*cm*, progressive cerebral ataxia, choked disk, reflex iridoplegia, was operated upon by callosal puncture and two weeks later a diminution of the choked disk could be observed. Four months later vision had improved to $\frac{5}{70}$. The optic nerves showed a moderate degree of atrophy after choked disk.

Bramann recommends callosal puncture in all cases of hydrocephalus which do not respond to internal treatment and have not been improved by the simpler methods of operation on the ventricles and lumbar puncture. He performed callosal puncture in eight cases of hydrocephalus. In brain tumor the autopsy showed six and seven months after the operation that the opening in the corpus callosum had remained patent. Bramann has abandoned lumbar puncture in brain tumor on account of the accidents which have been observed.

Halben observed a girl of 16 years with paresis of the left abducent nerve, bilateral choked disk measuring 2*mm*. Vision, right $\frac{1}{2}$; left 1. Field normal. The diagnosis was idiopathic chronic internal hydrocephalus. The puncture of the ventricles and of the spinal canals produced a transient reduction in pressure with recovery of the abducent and optic nerves. Recovery took place after Payer's operation. All symptoms were relieved, especially the abducent paralysis, nystagmus, choked disk, diminution of vision, headache, and tremor. The relief of these symptoms was regarded as due to the permanent reduction of the increased intraventricular pressure through the new-formed passages.

Case 6.—E. L., aged 5, was taken ill eight weeks ago with convulsions, fever, and a right hemiparesis. The eyes were always directed down and the head drooped. On ex-

amination the eyes are directed down so that the pupils are covered by the lower lids. There is no movement upward. The eye grounds are negative. The child apparently does not see. The head measures 44.5 and the chest 35*cm*. The sutures are open, the sagittal sutures to the extent of a finger, the coronary as much as a half finger broad. The large fontanel measures about the size of the flat of the hand. The occipital bones are like parchment. The veins are dilated. Chvostek negative. The right upper extremity is weak. The right knee joint is swollen and contracted. Babinski negative. Pirquet negative.

October 28, 1911. Lumbar puncture. About 14*cm* clear fluid evacuated.

October 29, 1911. The child is happy and smiles. The eyes are not turned down so much. There is no sight.

October 31st. The eyes are in normal position and can move upward. No vision. The large fontanel is depressed. The head circumference has diminished 1*cm*. The child is better able to hold its head. The retinal veins in the right eye which previously were congested are less dilated.

November 4th. The child again is holding its eyes turned down. Lumbar puncture withdrew 15*cc* of cerebrospinal fluid which contained sugar.

November 6th. No improvement. Head measures 45*cm*.

November 8th. 25*cc* are evacuated by lumbar puncture.

November 12th. No improvement. Head measures 45.5*cm*. A callosal puncture was then to be undertaken, but the mother took the child out of the hospital.

This is a congenital rapidly progressing hydrocephalus. The eyes are turned down. There is amblyopia without ophthalmoscopic changes. After the first lumbar puncture there was an improvement in the general condition and in the position of the eyes. Additional punctures were without result.

These cases show that the callosal puncture operation has not produced a single complication, on the contrary the following day the children were always decidedly brighter. There never has been a rise in temperature. Central vision improved a few days after the operation (in Case 1 after three days, in Case 3 after two days, in Case 5 after four days). The visual field was enlarged in Case 5 six weeks after the operation (11 days after the operation there was no improvement).

Cases 1 and 5 demonstrate that even in advanced optic atrophy the callosal puncture can improve and is to be recommended.

The above described cases illustrate four diseased conditions in which decompression operations are indicated, namely: (a) acquired hydrocephalus; (b) oxycephalus; (c) congenital hydrocephalus; (d) tumor of the brain. The best and most permanent results were observed in the acquired hydrocephalus. The value of an operation in oxycephalus cannot be determined at the present time; our experiences are too small, though recent observations seem to favor operation. In congenital hydrocephalus the result depends upon the kind of case. In severe cases the children usually die. If they continue to live the mental development does not progress satisfactorily. The slight cases, on the other hand, get well and the children develop intellectually in a normal manner. It is well known that there must be a communication between the ventricles and the subdural space with physiologically normal intracranial pressure, in order to supply normal nutrition and normal function for the brain. Continued increased intracranial pressure must have a deleterious effect upon the sight and the intellectual development of the child, and should be relieved by decompression operation.

The prognosis in brain tumor is individual and depends greatly upon the nature of the tumor and the time at which an operation is undertaken. It is above all necessary that an operation should be undertaken before vision is very much reduced. Visual disturbances are not at all uncommon following cerebral diseases in childhood, as is well known, and in some statistics on the causes of blindness in childhood, which I published (*Archives d'Ophtalm.*, 1911), 9% of the cases of blindness were the result of cerebral affections. In the outpatient Eye Department of the Sophien-Spital in six thousand patients (1904–1911) there were 32 cases of optic-nerve disease following cerebral affections. Deducting from this number 2 cases of brain tumor (in both of which there was choked disk), the causes in the remaining 30 cases were inflammation of the brain, of the meninges, and hydrocephalus. The ophthalmoscopic examination gave the following results:

Atrophia simpl.	7 cases
" post neuritidem	10 "
Amblyopia	8 "
Neuritis n. opt.	2 "
Atrophia	3 "
	30 cases

During this period in 5 additional cases atrophy of the optic nerves was discovered, presumably of congenital origin (in three of these retinitis pigmentosa was also present); furthermore 4 cases of optic-nerve affections after infectious diseases, 1 case of atrophy after scarlet fever, 1 case of amblyopia after an exanthem, 1 case of blindness after scarlet fever, 1 case of atrophy of the optic nerve and of the retina after an uncertain infectious disease. Furthermore, there were 17 cases of atrophy of the optic nerve, amblyopia without cause, and 1 case of optic neuritis following subcutaneous injection of salvarsan in interstitial keratitis. These statistics show that in children cerebral affections are the most important cause for diseases of the optic nerves, as in 59 cases there were 30 where a disease of the optic nerve was associated with the above-mentioned cerebral affections, excluding the 2 cases of brain tumor, about 50%. It is probable that this percentage is too low.

CLINICAL OBSERVATIONS ON IDIOPATHIC IRIDOCYCLITIS AND SYMPATHETIC OPHTHALMIA.

(A Contribution to Elschnig's Theory of Sympathetic Ophthalmia.)

By WALTER BROCK, M.D., Stuttgart.

Translated by Alfred Braun, M.D., New York.

ELSCHNIG sums up some exhaustive serological experiments, undertaken for the purpose of clearing up the much debated subject of sympathetic ophthalmia, as follows:

1. "I contend that there occurs in the eye a resorption of antigens in antigenous form, that, under certain influences, as during subconjunctival injections, an increase in the antigenous effect occurs, and under other circumstances, as in acute suppuration, a lessening of the antigenous effect of the substance introduced into the eye occurs. This fact was fully confirmed by Krusius and Kümmel by means of the most delicate method of anaphylaxis."

2. "I could prove that uveal emulsion (uvea and pigment-epithelium) introduced into the body of an animal had an antigenous effect. The active ingredient is probably the pigment."

Through these observations, the author arrived at the theory of the occurrence of sympathetic ophthalmia as the result of the oversensitiveness of the uvea, resulting from antigenous resorption of uveal tissue from the eye first diseased.

From a large clinical material and a study of the pathological anatomy of sympathetic ophthalmia during the past few years, Elschnig tries to prove the correctness of his hypothesis.

The present work is parallel to Elschnig's clinical studies, and will not consider the subject from a pathologic-anatomical standpoint. However, it should be noted that Reis has called

attention to the difficulties that stand in the way of Elschnig's theory of sympathetic inflammation from the pathologic-anatomical viewpoint.

Elschnig, through an examination of the causes of sympathetic ophthalmia and of the so-called idiopathic iridocyclitis or iritis, arrived at the conclusion, that there can be no real difference between idiopathic and sympathetic iritis, neither in regard to the involvement of both eyes, nor in regard to the course, nor the outcome of the disease; for

1. Non-traumatic iritis involves both eyes very frequently. According to Elschnig's as well as Schnabel's material, in the chronic inflammatory or insidious iritides, in the majority of cases there is either a simultaneous involvement of the other eye, or this follows after a longer or shorter interval.

2. The prognosis of idiopathic iritis is not so favorable as a comparison of the two forms of iritis might lead one to suppose.

3. Finally, sympathetic inflammation is by no means as malignant a disease as was heretofore supposed. Schirmer obtained cure in 14% of cases, and Gifford had even better results.

Elschnig believes to have found further support for his theory in the following two points:

First in anaphylaxis of the uvea, the judgment of which, as a purely serological problem does not fall within the scope of this work; and second, in the proof of a general constitutional anomaly, which manifests itself, in the cases of iridocyclitis which have no demonstrable etiology, in an increased excretion of indol.

From a number of cases examined by internists, this question is carefully gone over, and the demonstration of indol in the urine looked upon as an indicator of gastrointestinal disturbance.

E. v. Hippel doubts whether sympathetic ophthalmia can be wiped out as an independent disease, as it would then be necessary to recognize that spontaneous iridocyclitis could lead to sympathetic ophthalmia. Furthermore, the factors set forth by Elschnig, namely, anaphylaxis of the uvea and constitutional disease, occur very rarely, as in most cases it is in very healthy working people that a perforating eye injury is followed by a sympathetic inflammation in the other eye.

Furthermore, v. Hippel asks two questions, which interest us particularly from the standpoint of clinicians:

Does indicanuria occur as often in other clinics as in Prague, and does it not occur in other diseases of the eye?

And furthermore, has indican excretion the significance which Elschnig gives to it? v. Hippel had his material carefully gone over in regard to the first point, and came to the conclusion that in other eye diseases, neither more nor less frequently was there an increased indicanuria, than in idiopathic iridocyclitis.

This agrees with the examinations of Bernheimer, who states that the occurrence of an increased amount of indican in the urine has no special significance, according to his experience. For an increase of indican occurs in iridocyclitis as well as in retrobulbar neuritis, phlyctenular keratitis, senile cataract, and other eye diseases.

The second question v. Hippel answers by stating that, according to reliable investigators, indicanuria is a physiological occurrence.

Finally Stuelp made the statement, even before v. Hippel, that indicanuria can occasionally be considered to have an influence in eye diseases, but, according to his experience, we have no right, even in the presence of intestinal disturbances, to base an eye disease upon it alone, as long as every other etiologic possibility has not been excluded.

It seems therefore questionable, whether an increase of an organic combination, which varies in a normal bodily condition according to the intake of nourishment, can be assumed ever to be a pathological factor.

I can now turn to Reis's work, which attacks Elschnig's hypothesis from another side. He arrives, in harmony with other ophthalmologists, at the conclusion that spontaneous chronic uveitis occurs especially in anæmic young girls of tuberculous habit, whereas sympathetic ophthalmia occurs in healthy strong young men, and children, which agrees with the conclusions of Hippel, as well as the following experiences in Munich.

Furthermore, the course of the two diseases is too dissimilar to allow them to be considered identical. In sympathetic inflammation, the first outbreak decides the fate of both eyes, in most cases.

Along with several cures, with perfect or almost perfect vision, Reis reports nine cases, in which sympathetic ophthalmia caused blindness of both eyes in the first attack. Such an outcome was not observed by Reis in spontaneous iridocyclitis, even in the rapidly progressive cases of intrabulbar tuberculosis. Nor could he find any in the literature.

v. Hippel asks with right the question, why in spite of therapeutic intervention disease of the second eye in idiopathic iritis cannot be prevented, as according to Elschnig this is identical with sympathetic inflammation, and he has been able to prevent this latter through prophylactic internal treatment.

In conclusion let us look at Bach's statistics, who found in iritis and cyclitis, only in 15 to 20% of the cases, a double-sided involvement, and finds as the most common cause of the iritis tuberculosis and rheumatism; 70% of all cases of iritis get well, according to Bach.

I would like to state my position here, in connection with the following material, in regard to two points.

1. We also have, in agreement with Reis, a series of observations, where sympathetic inflammation could not be prevented in very healthy children, who received their eye injuries as the result of their extreme good health and liveliness.

2. Furthermore, it is also our experience that the first attack determines the entire further course of the disease in sympathetic ophthalmia. If some vision remains after the first attack, the later recurrences do not cause any appreciable diminution in the vision, whereas in spontaneous iridocyclitis the first attack rarely leads to blindness, while the succeeding attacks often do.

Scientific criticism, up to the present, has not been able to find a certain foundation for Elschnig's theories.

I turn now to the real subject-matter of my work, namely, the study of the clinical material, in the Munich University Eye Clinic, of iridocyclitis and sympathetic ophthalmia, from October 1, 1908, to May 31, 1912.

To state briefly the etiology of the cases to be detailed later, let me say that they agree with the common experience: *i. e.*, the most important etiologic factors among the cases which occurred in the last two years, which were examined with the

modern diagnostic aids (Wassermann and Pirquet), were tuberculosis, syphilis, rheumatism, gonorrhea; less common causes were chronic gout, or acute infectious diseases, such as diphtheria, pneumonia, and influenza.

Among the less common causes of iritis were two cases of herpes iridis, and one case of severe iridocyclitis in juvenile vascular disease, as the anatomical examination of the enucleated eye showed.

Of the 186 cases, 114 were unilateral, and 72 bilateral.

Of the last mentioned, 43 were attacked bilaterally at the same time, or within a short interval, the remainder after a long interval.

It is of course impossible to say how many had an involvement of the second eye after they were lost track of.

On comparing the Munich and the Prague statistics, we see that the differences are very slight, but where differences occur they speak against Elschnig's assumption.

If we look at the differences between unilateral and bilateral disease, we see that Elschnig has 50% and we 61.3% unilateral, as against Elschnig's 50% and our 38.7% of bilateral diseases. The Munich statistics show 11.6% less than Elschnig's, of almost complete unilateral blindness, and 20% less of the bilaterally blind.

Of the unilateral diseased cases, Elschnig shows 48% cured, while we show 54.4%. We have 48.5% total of healed eyes, while Elschnig has 35.6%

These results appear in an entirely different light, if we compare the outcome of spontaneous iridocyclitis with that of sympathetic ophthalmia.

To compare idiopathic iridocyclitis with the sympathetic form, that is to consider the disease of the second eye in spontaneous iritis as a sympathetic ophthalmia (through anaphylaxis of the uvea), with Elschnig, meets with decided objections, because duplicity of inflammation forms the specific characteristic of sympathetic disease.

However, even according to Elschnig's statistics, spontaneous iridocyclitis occurs unilaterally in 50% of the cases; according to our statistics, in 61.3%; and according to Bach, in 70%.

And if Elschnig states that especially in insidious cases of

iridocyclitis, in which, on the one hand, an extensive tissue-destruction and consequent anaphylaxis of the uvea is to be assumed, and, on the other hand, no acute disease exists as a cause, but rather a chronic or long-continued constitutional anomaly exists, both eyes are diseased in the majority of cases, we can answer, on the basis of our statistics, that just in such cases the disease was unilateral, at any rate, for over a year.

One of these cases finally came to enucleation. The anatomical finding in this eye, which was reported in detail by Gilbert, showed not the slightest resemblance to the picture which is characteristic for sympathetic inflammation.

We will also see that, from the statistics of the material in the clinic, the prognosis of sympathetic ophthalmia is entirely different. For at the same time that the 186 cases of spontaneous iridocyclitis were under observation, there were ten cases of sympathetic ophthalmia. Eight of these entered the clinic with well-developed sympathetic ophthalmia. In the remaining two cases, the sympathetic inflammation occurred, once after the proposed enucleation was refused, and another time after extraction with detachment of the retina.

Of these 10 cases, 9, *i. e.* 90%, are to be considered blind, according to the principles of Elschnig's statistics.

If we take the number of diseased eyes, out of 20, 19, or 95%, became blind.

If we compare with these figures the number of eyes blind from idiopathic unilateral and bilateral iridocyclitis, we find that out of 258 diseased eyes, 54 became blind. That is not quite 21% of blindness, as against 95% in sympathetic ophthalmia.

Of these nine cases of sympathetic ophthalmia, which, according to Elschnig, are to be considered as blind in the second eye, there were two, who, at the end of the first attack could still count fingers at 4 to 5 meters, and, in harmony with the experiences of Reis, retained this amount of vision even after several recurrences.

I would like to differ from Elschnig in favor of his theory in regard to these two cases, and not consider them blind. But even then, there remain, counting by cases, 70%, counting by eyes, 85%, of blindness from sympathetic ophthalmia, as

against 20% and 21% from spontaneous iridocyclitis, a difference which speaks very decidedly against Elschnig.

If we consider further in the interest of Elschnig's hypothesis that we might accidentally have had especially favorable cases of spontaneous iridocyclitis, and especially unfavorable cases of sympathetic ophthalmia, the difference between 20% and 70% is sufficiently great to allow for such possibilities and yet give a marked difference between the outcomes.

But it is not necessary to make these exceptions in favor of Elschnig's hypothesis, for our results agree perfectly with those of Bach in this regard. For he saw 70% of iritis cured, and 15–20% of iritis and cyclitis occur bilaterally, which last number is very small, even as compared with our own experiences.

Our clinical statistics, therefore, speak for the fact that so-called idiopathic iridocyclitis differs from sympathetic ophthalmia, both from the point of view of its double-sided occurrence, as from the point of view of the prognosis and outcome of the disease.

The clinical picture can therefore not be taken as support for Elschnig's hypothesis of the occurrence of sympathetic ophthalmia.

I wish to express my thanks to Privatdozent Dr. Gilbert, for his suggestions in regard to my work.

REPORT OF THE TRANSACTIONS OF THE SECTION ON OPHTHALMOLOGY OF THE NEW YORK ACADEMY OF MEDICINE.

By GEORGE H. BELL, M.D., Secretary.

H. H. TYSON, M.D., CHAIRMAN. MONDAY EVENING, OCTOBER 19, 1914.

Dr. M. J. SCHOENBERG presented (1) a patient with **chorio-retinitis juxta papillaris** (Jensen). The patient, a girl, 18 years of age, a dressmaker, noticed two months ago that she could not see with her left eye. A week later, she called for consultation, and her condition was found as follows: V., O.D., $\frac{20}{30}$ +; O.S., movement of hand. Fundus, O. D., normal; O. S., optic disk congested above, hazy below and temporally, as if covered by a thin whitish exudate. Further temporally, at a distance of about 2 p.d. from the disk, and somewhat below, a white area, somewhat smaller than that of the disk; almost round, woolly in appearance, and slightly prominent. A small retinal vessel disappears in the thickness of this white area at its nasal margin. A red, small, horizontal streak—probably a hemorrhage—is seen on the surface of this area of infiltration. A little below this white spot, there is a dark patch with some streaks of choroidal atrophy and retinal blood-vessels running over this pigmented area. The vitreous is full of a dusty mass; besides, a veil-like string extends on the nasal side in antero-posterior direction, but does not seem to have any fixed connection with the disk or retina. During the first ten days while under my observation, several round, pale, small foci appeared around the white patch, mostly below and to its inner side. After about ten days, they began to unite into a sinuous line. At present the process seems to retrogress, as the patch begins to flatten, and the area

around is less congested and begins to show signs of pigmentation.

The general condition, the family or the personal history, give no clue to the present trouble. She has been constantly feeling well, and looks well. Her parents and eight brothers and sisters are in good health. No lues or tuberculosis in the family. The physical examination, including a careful study of the nose, mouth, Wassermann and tuberculin (subcutaneous) tests, urine examination, blood count, and differential count, is all negative.

The first cases of this kind described by E. Jensen, and the majority of those described by Groes-Petersen, are young girls in apparently perfect health. The condition is relatively benign, as it has no tendency to spread, but recurrences are frequent. In my own case, the dark patch seen below the area of infiltration speaks in favor of a previous attack. The vision is at present $\frac{20}{100}$, and the field of vision, normal to the periphery, shows a central scotoma of about five degrees around the fixation point. The blind spot is slightly larger, but there is no connection between the two scotomas. The refractive condition in both eyes is a slight degree of hyperopia.

(2) The second patient (**intraocular foreign body**) presented by Dr. Schoenberg was a laborer, 23 years of age, who twelve years ago was the victim of the explosion of a cap. The left eye was "sore" for a few months after the accident. Seventeen months ago, the patient had a cataract extraction. The eye had remained quiet up to the time of the operation and also after that until six months ago, when it became painful and red. When he came to the clinic he had an iridocyclitis of the left eye. V., O. D., $\frac{20}{20}$; O. S., movement of hand. Light projection, good; fundus could not be seen on account of the vitreous opacities. The iris presented a small yellowish prominence below and to the temporal side of the pupillary margin, and a pin-point grayish mass of exudate on either side of this prominence. The X-ray shows the presence of a foreign body about $1\frac{1}{2}mm$ long in the zonular region at the temporal lower quadrant. The foreign body seems to be non-magnetic, and the history of the accident points to a piece of copper. The explanation of why the eye remained quiet for so many years with that piece of copper in its

interior may be given by admitting that the foreign body may have been in the lens cortex and that the cataract operation may have dislodged it farther down behind the iris, following which the present iridocyclitis resulted.

Dr. R. G. REESE presented (1) a man, age 35 (**intraocular foreign body removed through scleral incision**), who had had a foreign body in the globe for forty-eight hours, when first seen by him. The foreign body entered the eye through the sclera, and the X-ray showed that it was projecting through the sclera on the opposite side into the orbit. The foreign body was pulled back into the vitreous and then extracted through a triangular opening in the sclera, which was made between the superior and external recti muscles. The triangular incision was so made that the base of the conjunctival flap corresponded to the apex of the scleral flap. No vitreous was lost at time of operation. The size of the foreign body was 2 x 16 *mm.* The vitreous is still filled with blood, but the patient has light perception.

(2) The second case presented by Dr. Reese (**intraocular foreign body**) gave a history of having had a foreign body in the eye for five years. The vision had been failing for three years, but the pupil reacted to light. The foreign body was located by the X-ray in the ciliary body. The magnet was tried, but with no effect. He then extracted the lens, which had become cataractous. At the time of the extraction the stain of the foreign body (iron rust) could be seen on the side of the lens. He slipped the Kalt forceps behind the iris and tried to dislodge the foreign body, without any result. Two weeks after another iridectomy the iron particle could be seen and was extracted with the forceps. The size of the foreign body was 1 x 2*mm.* With sphere + 11 vision was normal.

Dr. OSCAR DIEM presented a patient on whom the Kroenlein operation and decompression for **retrobulbar tumor** had been performed on October 19, 1914. The man, 21 years old, married, with no history of lues or tuberculosis and no previous eye affection, noticed in the second half of October, 1913, swelling and pain of the left eye, and two weeks later had double vision when looking to his left. In December, 1913, he consulted an eye hospital, where through an incision

on the lower orbital margin a piece of tumor was excised,—microscopically found to be carcinoma,—and operation, with perhaps enucleation, was proposed, which the patient refused. He came under our observation, through his private physician, on December 22, 1913, with vision in right eye $\frac{20}{70}$ + 25 +50 90°, otherwise normal. Left eye, vision $\frac{20}{70}$; scar on lower orbital margin; limited motility temporally and downward; protrusion of *4mm*; clear media; pronounced choked disk. No palpable tumor. No vessel noises. No changes when compressing vessels of neck. Wassermann negative. Negative examination in skin, nose, nervous, Roentgen departments. Diagnosis: Retrobulbar tumor, perhaps of inflammatory nature. Therefore, the patient was referred to his physician for anti-luetic treatment,—which was done with mercury injections, salvarsan injections, rubbing with mercury ointment, until he came to our next observation on June 16, 1914, which showed vision worse, increased protrusion, increased choked disk; Wassermann negative. June 16, 1914, during Kroenlein operation by Dr. O. Schirmer, a tumor on the floor of the orbital cavity—with no limit to be reached backward—was found, and a piece which was excised for microscopic examination showed an inflammatory tumor. Good recovery. July 15, 1914, the patient came with these complaints: headache, with dizziness and vomiting; vision of right eye rapidly deteriorating. Findings:—Right eye: vision, finger-counting at ten feet; incipient choked disk. Left eye: as before. Wassermann negative. He was directed into surgical hands. He received anti-luetic treatment. Wassermann was for the first time 1+. The brain symptoms increased, and the vision diminished rapidly in both eyes,—in left eye, even to amaurosis. Decompression through excision of a large piece of the left temporal bone was done on July 29, 1914, by Dr. M. Rehling, who found, after incision of the dura, infiltration of the vessels of the pia, considered to be of syphilitic nature. The vision and general condition improved rapidly. The anti-syphilitic treatment was continued. September 21, 1914: Vision: R., $\frac{20}{200}$ L., hand motion before eye. Disk in right eye, slightly indistinct; in left eye, the same, with incipient atrophy temporally; eyeball, little protruded. October 2, 1914: Right: $\frac{20}{70}$ + 15 + 50 90°; left, hand motion before

eye. Right disk still more distinct; left, the same, but atrophy more pronounced.

Dr. J. H. CLAIBORNE thought the results from the Kroenlein operation in this case were very striking indeed. The experience that he has had proves to him that the Kroenlein operation is not always necessary. A number of years ago, a woman came to him with a tumor of the orbit and marked proptosis. He made a very deep incision along the top of the brow and on putting in his finger he found the tumor, which extended back to the optic nerve. In operating, he also chipped off a portion of the outer side of the orbit so that he could get at the tumor better. He removed the tumor through this incision. Another objection to the Kroenlein operation is that it always leaves a big scar.

Dr. T. R. CHAMBERS said: "I don't see where the scar comes in. I've done several myself, and almost all the scar disappears after a time."

Dr. R. G. REESE had seen this patient at the Infirmary. This operation could not have been done according to Dr. Claiborne's method. A solid mass was found in the lower portion of the orbit, when the man was put under an anæsthetic. He made an incision and removed a small piece for examination. Wassermann negative. T. O. negative. X-ray negative. Vision, at first normal; afterward, a neuro-retinitis developed. The laboratory report was carcinoma. The patient refused further treatment; was put on mixed treatment, and discharged.

Dr. TYSON stated that he was present at the time Dr. Schirmer performed the Kroenlein operation on Dr. Diem's patient, and that the appearance of the tissue was that of an intense inflammatory nature, probably specific. He did not think that the orbit could be explored as satisfactorily with the operation mentioned by Dr. Claiborne as with a Kroenlein, and in his opinion in this case especially the Kroenlein was the better operation.

Dr. CLAIBORNE then said: "My suggestion was not to offer my operation instead of Kroenlein's in all cases, but I think there are a great many retrobulbar tumors that can be removed in this way."

Dr. DIEM said that Kroenlein had first performed this

operation in 1886, and he employed it for the next three years before he published the results. It proved to be a great thing in ophthalmological surgery. Dr. Claiborne's operation could not have been done in this case.

Dr. A. D. MITTENDORF presented a case of **retinitis proliferans** in a woman 46 years of age. Diagnosis when first seen three years ago: Retinal arteriosclerosis; no hemorrhage. At that time, V. O. D., $\frac{20}{50}$; V. O. S., $\frac{20}{40}$. In June, 1913, numerous small retinal hemorrhages could be made out and old scars. A fine, transparent skin, with crescentic margin, with numerous blood-vessels, was seen extending over the inner half of both nerves, while nasally it passed into the retina. Have seen patient many times since then, and could watch skin gradually extend over both optic nerves. October 23, 1913: Small vitreous hemorrhage which has entirely absorbed. September 5, 1914: For the first time it could be seen that the transparent skin of vessels was elevated from the optic nerve and beginning to extend into the vitreous. This has become more marked, and the apex in the right eye is raised about five diopters. Vision on October 19, 1914: O.D., $\frac{10}{200}$; O. S. $\frac{15}{200}$. Wassermann negative. Urine, 2.5% sugar. Trace of albumin and casts are found.

Dr. G. H. BELL presented a patient, 48 years of age, with **ophthalmoplegia totalis** and a specific history. The urine was negative, and the blood pressure normal. Wassermann was negative. A lumbar puncture was made, and the spinal fluid was positive. It was then decided to give him an intraspinal injection. He was given a full dose of salvarsan in the vein of his left arm at nine o'clock A.M. and an hour later 60*cc* of blood was taken from him. The Swift and Ellis method, as modified by Mr. Birchell of the New York Eye and Ear Infirmary, was followed. At three o'clock of the same day 15 *cc* of the salvarsanized serum was injected into the spinal column. The patient experienced little or no pain at the time of the injection, and there was no reaction and no pain in head or back of neck following the operation. He was allowed to leave the hospital in 36 hours, at which time inunctions and sat. sol. K. I. internally were prescribed for him. At the end of two weeks, there was marked improvement. Four weeks from the time he had his intraspinal injection of

serum he was able to return to work. Vision in both eyes, normal.

Dr. H. H. TYSON presented a case of **degeneration of cornea.** The patient was a married woman, age 51. Ten months ago she noticed a small white dot, the size of a pin-head, on the cornea of her eye. At that time her eye felt "scratchy," but was not inflamed nor painful. No previous history of traumatism or sore eyes. The white patch has gradually increased in size until at present it is about *3mm* in diameter, with slight injection of cornea toward the side of the patch which is located in the substantia propria, extending from the edge of the pupil to within about *2mm* of the sclero-corneal junction. The superficial epithelium is slightly raised but not broken. No pain; corneal sensibility diminished over area. Wassermann and von Pirquet, negative. Urine: specific gravity, 1020; acid; trace of albumin; no sugar. The etiology in these cases is obscure. Fehr, who has reported similar cases, thinks they are due to development of hyaline masses in the superficial lamellæ of the cornea, in which crystals of phosphate of sodium are subsequently deposited; while Fuchs, who in one case examined microscopically a section of the cornea, found it softened and with Bowman's membrane absent. The deposit was amorphous and was located in the substantia propria. In Dr. Tyson's case, the degeneration is probably influenced to a certain extent by a defective metabolism.

Dr. M. J. SCHOENBERG made a few remarks about **general and local ocular anaphylaxis,** mainly about its theoretical and practical importance and practical significance, its application to the understanding of various complicated problems in physiology, pathology, and especially ophthalmology. He then spoke about ocular anaphylaxis and its relations to the rest of the organism; and finally reviewed his own experiments on rabbits, in which he used as an antigen human serum or tuberculin. His conclusions were that with the above-mentioned antigens it may be possible to produce a state of anaphylaxis in the eyes of rabbits by sensitizing the organism first and then the eyes, or *vice versa.*

Dr. A. E. DAVIS opened the discussion on Dr. Schoenberg's paper, and after expressing his appreciation of it, said: "I

am especially interested in the anaphylaxis produced by the tuberculins. That the various tuberculins are true antigens and are capable of producing anaphylaxis, and in this way bringing about immunity to the action of tubercle bacilli, there is no longer any doubt.

"It may be well to state, in passing, that so far neither in animals nor in man have we been able to establish a complete or absolute immunity (protection) against tuberculosis. It is only relative or partial. While a lesion may be healed and the resisting power of the individual be greatly increased, it does not insure that the reinfection may not take place if the subject is exposed to a virulent infection. It should be stated also that spontaneous immunity to the disease may take place; that is, the patient may manufacture antibodies as the result of the secretion of toxins from the living tubercle germs with which he is infected, and a cure result. Here again the resistance to future infection is greatly increased and usually renders the subject immune to mild infections, but the immunity is not absolute and the subject may be reinfected by a virulent type of tubercle bacillus.

"I also hold the same opinion, so concisely stated by Hamman and Wolman in their recent publication, 'Tuberculin in Diagnosis and Treatment,' which is to the effect: 'Until contradictory evidence is forthcoming, if such evidence can ever be obtained, the conclusion is completely justified that all tuberculins, if active, owe their activity to the presence of the specific protein of the tubercle bacillus,—whether this be in solution, in ultra-microscopic particles, in microscopic particles, or in unaltered bacillary bodies. In its broad principles, tuberculin hypersensitiveness unquestionably is closely related to the phenomenon of protein hypersensitiveness. The time of its development after infection, the character of the reaction symptoms, its elevation following the administration of small amounts of tuberculin, are all important points.'

"It is only by such practical and valuable experiments as related by Dr. Schoenberg, that we may hope to bring about even a tolerable understanding of this intricate subject of anaphylaxis and its bearing on immunity and the cure of disease. Incidentally, his paper emphasizes the necessity of

animal experimentation if we are to advance in the knowledge of medicine."

Mr. E. BIRCHELL said: "It has been my privilege, through the kindness of C. E. MacDannald, to obtain the histories of the parents of a number of children afflicted with hereditary interstitial keratitis. The father usually gives a positive history and a negative Wassermann, and the mother a negative history but strongly positive serum reaction. The blood of the keratitis patients invariably reacts positively to Wassermann and Noguchi tests. These observations suggested to me the examination of the semen of several of the parents as to the presence or absence of the spirochætæ—with uniformly negative results. I examined and found negative the blood of a man who had intercourse with a woman whose blood gave a four plus Wassermann; her child had interstitial keratitis, and her husband a positive history but negative serum test. These findings seem to bear out to some extent the paper of Dr. Schoenberg, for in these cases it would hardly appear as though the spirochætæ were the cause, but rather some highly sensitized protein substance capable of producing anaphylaxis."

Dr. W. B. WEIDLER expressed his appreciation of Dr. Schoenberg's most excellent and interesting paper, and said that he himself had been using tuberculin for diagnosis and treatment, but that this paper presents a new phase of the question; and he asked Dr. Schoenberg to explain how tuberculin acts in these cases of ocular tuberculosis.

Dr. SCHOENBERG replied that he could not give a very plausible explanation. It seems probable, however, that the injection of tuberculin in a patient with some tuberculous affection—and consequently previously sensitized by t. b.—produces an anaphylactic reaction, locally, in the eye, if the case is one of ocular tuberculosis. Since we control our reaction by using infinitesimal doses, the local anaphylaxis in the eye consists only in a more or less marked hyperæmia, which acts beneficially upon the focus. So we see that in tuberculin therapy we employ the anaphylactic reaction as a curative measure.

REPORT OF THE TRANSACTIONS OF THE SECTION ON OPHTHALMOLOGY OF THE ROYAL SOCIETY OF MEDICINE.

By Mr. C. DEVEREUX MARSHALL, F.R.C.S., London.

An ordinary meeting of the Section was held on Wednesday, November 4th, the President, Mr. Priestley Smith, F.R.C.S., in the Chair.

Mr. Hugh Thompson showed a young girl who had dilated pupil of Argyll-Robertson type, with well-marked contraction on closure of lids. The condition was not congenital in her, because two years ago her pupils were normal, and she had only slight myopia. The knee-jerks were normal. He also exhibited a case of **one-sided internal ophthalmoplegia.** The man was invalided from the Navy two years ago on account of supposed aneurysm. He was a stoker in the Navy, and since he left he had been doing similar work—stoking—in a brewery. Sir John Broadbent failed to find signs of an aneurysm.

Mr. Rockcliffe spoke of two cases in his experience with **mydriasis and iridocycloplegia.** In one there was a strong family history of retinitis pigmentosa, but in the patient there was no retinal or pigmentary change. One patient's end was in an asylum as a general paralytic.

Mr. N. Bishop Harman showed a case of **congenital entropion.** The lashes in the lower lid were permanently erect, and the child was born with the condition. The Meibomian glands seemed deficient. The mother was normal, but the grandmother was said to have had a double row of lashes. He proposed to split the lid, so as to separate the lashes from the glands, and graft between the two a strip of mucous mem-

brane. If that succeeded, he expected the lashes would be prevented from reaching the cornea again. Mr. Mayou referred to three similar cases which he had had. He operated upon them by taking out a narrow band of skin on the outer side of the lid. There had been no recurrence, though one was operated upon five years ago.

Mr. BISHOP HARMAN read notes of a case of **high myopia** in an infant.

Mr. W. H. JESSOP showed a case of **tumor of the lower lid,** which he regarded as a lymphangioma. Skiagrams showed nothing abnormal about the bones, and skilled nasal investigation was negative. Surgeon-Major Elliot mentioned a similar case which he saw in India, and which was found to be sporotrichosis ochonelia. Mr. Leslie Paton said he had seen a similar case following the extensive scarring from lupus, and there was complete blockage of the lymphatics draining the eyelid. He asked a colleague to establish a permanent drain into the lymphatics of the lip. Mr. Harman reminded members of a case shown at the Laryngological Section in which drainage was done into the neck, and answered fairly well.

Mr. A. W. ORMOND exhibited a case for diagnosis, which was generally regarded as inflammatory.

Mr. H. L. EASON exhibited an interesting example of **confluent tubercle of iris.** Tuberculin had not improved it. As perforation was occurring in the ciliary region, the only course was removal of the eye. He had had a case in which perforation occurred in three weeks; in this case it commenced in the fifth week of the history.

Mr. DAWNAY showed a patient suffering from **intraocular metastatic carcinoma.**

Mr. W. T. HOLMES SPICER read a communication entitled **Cysts in the anterior chamber arising from the pars ciliaris retinæ,** and illustrated it by a number of slides. The case had been under observation seven years; it began with a white spot at the edge of the pupil at three months of age. At 16 months, when first seen, there were three opaque, finger-shaped masses coming into the anterior chamber from behind the iris. Four years later these had disappeared, and a cyst about 4*mm* in diameter was seen floating freely in the anterior chamber. Other cysts appeared later, and finally there were seven, float-

ing like toy balloons in the anterior chamber. In the meantime the eye had become glaucomatous, a ciliary staphyloma had formed, and the eye was removed. The pathological examination was made by Mr. Greeves. It was found that the cysts were formed of embryonic retinal tissue, containing vitreous. They had their origin in the pars ciliaris retinæ, starting from cellular membranes which grew over the iris and also into the vitreous; the cysts grew on the surface of these membranes. There was, in many places in the walls of the cysts, a resemblance to glioma tissue The case further proved the non- mesoblastic origin of the vitreous.

Mr. TREACHER COLLINS, discussing the case, said it bore out the view of the embryologists that the vitreous tumor was derived from neural epiblast, and that it was derived from only one portion of it.

Mr. MAYOU referred to a case of his own in which there was a **pigmented tumor in a microphthalmic eye,** consisting of epithelial cells. It occupied only an eighth of the segment of the ciliary body.

Mr. W. LANG spoke of a case he saw with Professor Fuchs in which there was a semi-translucent brownish cyst in the anterior chamber. Since then he had had a similar case of his own, but an attempt to deal operatively with it was not a success.

QUARTERLY REVIEW OF THE PROGRESS OF OPHTHALMOLOGY.

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SECOND QUARTER, 1914.

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1. BARTELS. M. **Hypophyseal disturbances.** *Klin. Monatsbl. f. Augenheilk.*, May, 1914, p. 664.

2. BENEDICT, W. L. **A study of the eye grounds in psychoses.** *Annals of Ophthalmology*, April, 1914.

3. FERNANDEZ, JUAN SANTOS. **Ocular syphilis in our ophthalmic practice.** *Clin. Opht.*, p. 305.

4. FISCHER, J., and TRIEBENSTEIN, O. **Researches concerning tetany and senile cataract.** *Klin. Monatsbl. f. Augenheilkunde*, March–April, p. 441.

5. FISCHER–GALATI, TH. **New relations between the nose and the eye.** *Monatschr. f. Ohrenheilk. u. Laryngo-Rhinologie*, xlviii., p. 136.

6. FLEISCHER, B. **Pathology of tumors of the hypophysis.** *Klin. Monatsbl. f. Augenheilkunde*, May, p. 625.

7. GALLEMAERTS. **Chloroma with intraocular metastases.** *Ibid.*, June, p. 878.

8. GRUMME. **Concerning the theory of exophthalmic goiter, myxœdema, cretinism, and goiter. Hyper- and hypothyroidismus.** *Berliner klinische Wochenschrift*, No. 16, p. 737.

9. HAERTEL, FR. **Concerning the treatment of trigeminal neuralgia by intracranial injection.** *Medizinische Klinik*, No. 14, p. 582.

10. HILBERT, R. **Yellow vision sometimes appearing in jaundice.** *Centralbl. f. prakt. Augenheilkunde*, March, p. 67.

11. JESS, A. **Headache and the eye.** *Berl. klin. Wochenschr.*, p. 629.

12. KRAILSHEIMER, R. **Tumor of the hypophysis.** *Klin. Monatsbl. f. Augenheilkunde*, March-April, p. 529.

13. LOEHLEIN, W. **Early cataract with atrophic myotonia.** *Ibid.*, p. 453.

14. MAKLAKOW, A. **Ocular manifestations in a case of telangiectasia of the cerebellum.** *Annal. d'oculistique*, cli., p. 252.

15. PATTON, J. M. **Ocular symptoms associated with oxycephalus or tower skull.** *Annals of Ophthalmolgy*, April, 1914.

16. POLLAND, R. **Treatment of syphilis with embarin.** *Therapie d. Gegenwart.*, 1914, p. 161.

17. RAUBITSCHEK, E. **Papillitis in albuminuria.** *Klin. Monatsbl. f. Augenheilkunde*, March–April, p. 457.

18. REICHMANN, Fr. **Pupillary disturbances in dementia præcox.** *Arch. f. Psychiatrie u. Nervenkrankheiten*, liii., 1, p. 302.

19. TIETZE. **A tumor of the brain successfully removed.** *Berliner klinische Wochenschrift*, No. 15, p. 716.

20. UHTHOFF, W. **Two notable cases of tumors of the hypophysis.** *Klin. Monatsbl. f. Augenheilkunde*, March–April, p. 529.

21. ULBRICH, H. **Sudden onset of bitemporal hemianopsia.** *Ibid.*, p. 536.

22. VINSONNEAU. **Ocular lesions in epidemic cerebrospinal meningitis.** *Annales d'oculistique*, cli., p. 466.

23. VON EIKEN. **Retro-auricular abscess with choked disk. Sinus thrombosis on the right side with choked disk.** *Med. Klinik*, No. 14, p. 612.

24. WEHRLI, E. **Tumors of the hypophysis and treatment with organ extracts.** *Klin. Monatsbl. f. Augenheilkunde*, May, p. 653.

GRUMME'S (8, **Hyper- and hypothyroidism**) theoretical views may be summarized thus: 1. The primary cause of myxœdema is a lack of iodine in the food and so a lack of iodine to be metabolized. 2. The cause of exophthalmic goiter is a thyroid gland rendered functionally weak by an overabundance of iodine in the food. Hence myxœdema is benefited by an organic thyroiodate, while exophthalmic goiter is injured by iodine in any form, organic or inorganic. He also ascribes endemic cretinism and endemic goiter to a lack of iodine in the food of the child or of the mother, hence these diseases are not met with where people have much iodine in their food. Exophthalmic goiter he believes to be neither

hyperthyroidism, nor hypothyroidism, but rather to be caused by an excess of exogenous, unassimilated iodic albumin. In myxœdema he thinks the hyperthyroidism to be at most secondary.

JESS (11, **Headache and the eye**) briefly reviews the most important anomalies and diseases of the eye that give rise to headache, and of diseases of other organs the initial symptom of which frequently is headache and the early diagnosis of which can often be made only through an accurate examination of the eyes. He deals specially with the heterophorias met with in neurotics and epileptics, the most obstinate of which is hyperphoria. Cyclophoria is less common. He also speaks of insufficiency of the convergence, or accommodative asthenopia, the occipital headache often associated with affections of the margins of the lids and conjunctiva in emmetropes and particularly in hyperopes, glaucoma, with a short differential diagnosis from iritis, choked disk as a symptom of increased pressure within the skull, retinitis albuminurica with nephritic headache, with particular reference to retinitis albuminurica gravidarum. The therapeusis of heterophoria, glaucoma, and choked disk in particular is briefly described.

FISCHER and TRIEBENSTEIN (4, **Tetany and senile cataract**) have instituted systematic researches on patients with senile and presenile cataract, the results of which render it probable that the parathyroid glands have an etiological significance in the occurrence of senile cataract. They found positive signs of latent tetany in sixty out of sixty-eight patients with senile cataract—that is, 88.2%. On the other hand, in twelve cases without cataract the diagnosis of latent tetany was negative in ten, positive in one, doubtful in one. The signs of latent tetany are therefore to be met with much more commonly in people with senile cataract than in persons with clear lenses, and this leads us to suspect a pathogenetic connection between tetany and senile cataract. In most cases the history rendered it probable that the tetany appeared first in old age.

In LOEHLEIN'S(13, **Early cataract with atrophic myotonia**) 29-year-old patient the lens of the left eye was uniformly opaque, while the lenticular opacities in the right were much more delicate, consisting of radiating groups of points and punctate clouds. The right papilla was pale yellow, and an arched

scotoma was present, extending out from the blind spot. The neurological examination revealed atrophic and paretic symptoms in the musculature of the face and limbs, with absence of the tendon and radioperiosteal reflexes. As there were no signs of syphilis, tuberculosis, or disease of the accessory sinuses, the atrophic changes in the optic nerve were held to be etiologically connected with the atrophic myotonia and the early cataract.

FISCHER–GALATI (5, **New relations between the nose and the eye**) report three peculiar cases. The eye symptoms in the first case were hemeralopia and poor vision, in the second bad vision and weariness during near work, in the third loss of vision to counting fingers with a large central scotoma. In all three adenoids were found in the nasopharyngeal space, and vision was restored after they had been removed. The symptoms could not be imputed wholly to hysteria. In the second and third cases a toxic retrobulbar neuritis might perhaps be suspected to have arisen from the plugs of pus that filled the tonsillar crypts, which produce during decomposition substances that are harmful to the papillomacular bundle. In the first case the blood was surcharged with carbon dioxide in consequence of the difficulty of respiration, whereby irritation was exerted not only on the respiratory center, but also on the fibers of the trigeminus, resulting in dilatation of the choroidal, and contraction of the retinal vessels. After this irritation of the trigeminus had been removed the retina remained only moderately injured.

HILBERT (10, **Yellow vision sometimes appearing in jaundice**) describes a case of carcinoma of the liver in which, after a rapid yellow discoloration of the eyeball and of the entire skin, yellow vision ensued. Bright objects appeared to the patient to be sulphur yellow, dark brownish, and dirty, yet the vision was good. A greenish-yellow discoloration of the cornea and lens could be distinctly seen by oblique illumination.

GALLEMAERTS (7, **Chloroma with intraocular metastases**) clinically saw intraocular metastases in a case of chloroma with tumors in the lungs, liver, kidneys, heart, meninges, and brain. He saw retinal hemorrhages, white spots in the retina, and a tumor of the papilla. At the autopsy the retina was found to be detached and full of chloromatous tumors, with a tumor

also in the choroid. The differential diagnosis from leucæmia was made through the green pigment.

TIETZE (19, **Tumor of the brain successfully removed**) reports the case of a patient 37 years old who had had a traumatism to the skull long before. Eleven years later, symptoms of numbness appeared, which gradually increased for four years, and were associated with pareses and finally with sudden blindness. On opening the skull an apparently inoperable diffuse tumor was found next to a large piece of bone over the right central convolution, beneath the dura. All symptoms rapidly disappeared after this decompression, but as they returned the tumor was removed two years later. The operation was very bloody. The tumor was soft, grayish yellow, and fibrous; microscopically it proved to be a glioma. The patient made a good recovery.

FLEISCHER (6, **Pathology of tumors of the hypophysis**) has collated fifteen cases. The period of observation in the majority was from two to fifteen years. These show that as a rule the loss of vision is not to be arrested without operative intervention. The pure complete bitemporal hemianopsia is only a transient symptom; while in many cases there is an advancing temporal contraction of the field, paracentral, bitemporal scotomata occur in some, and central scotomata may appear early. Often one may find a far advanced disturbance of the color perception with a normal field for white. The central scotoma may be explained by laceration and stretching of the macular fibers in the chiasm without immediate pressure by the tumor. Operation was productive of a very good result in three cases, preservation or improvement of the vision, and good general condition. In the opinion of the author success depends less on the method of operation than on the familiarity of the surgeon with the method employed. At all events he considers operative treatment imperatively indicated, especially when blindness is threatened.

On the other hand, WEHRLI'S (24, **Tumors of the hypophysis and treatment with organ extracts**) case shows that tumors of the hypophysis may be improved or cured without operation. In his patient the chiasm was compressed from below by a tumor of the hypophysis, while hypophyseal obesity and loss of genital function contraindicated operation. The treatment

given was at first potassic iodide and tablets of the hypophysis, later the latter alone. At the end of nearly three years the improvement of the vision of the right eye was from 0.1 to 1.4, that of the left from movements of the hand at 30*cm* to counting fingers at 1¼*m*. There was a considerable optic atrophy at the time of the first examination. The visual field had lost its bitemporal hemianopic character and had enlarged considerably; the body weight had fallen from 135 to 120*kg.*; the headache and debility had disappeared. The author emphasizes two facts: The visual field was hemianopic very early and for a long time alone for colors, while the limits for white were irregular, and the marked atrophy from pressure was capable of very marked improvement and restitution. His recommendation of this form of treatment, 0.1 gram tablets of hypophysis, in combination with small doses of iodide of potassium, he confines to cases of hypopituitarism, dystrophia adiposo-genitalis.

BARTELS (1, **Hypophyseal disturbances**) is of the opinion that in the cases of tumors of the hypophysis with dystrophia adiposo-genitalis, in which the primary homologous sexual characteristics are stunted, the latter results are dependent not so much on the tumor as on a simultaneous congenital anomaly of the germ that leads to the development of the tumor and to the genital disturbances.

UHTHOFF (20, **Two notable cases of tumors of the hypophysis**) reports the two following cases. The first patient was 17 years old, a dwarf weighing 53 pounds. He had temporal hemianopsia of the right eye, the left had been totally blind for a long time, dilatation of the sella with a visible tumor, atrophy of the thyroid gland, and relatively good intelligence. The other patient, 21 years old, weighed 250 pounds. He had dystrophia adiposo-genitalis, was blind in one eye, and had relatively good vision in a small portion of the inner half of the field. His thyroid gland likewise was atrophied, and he showed symptoms of acromegaly. Neither patient was operated on.

KRAILSHEIMER'S (12, **Tumor of the hypophysis**) 38-year-old patient had a tumor of the hypophysis, marked acromegaly, and had been losing vision for about a year. She had a typical bitemporal hemianopsia and optic atrophy. She was operated on, died of meningitis, and the autopsy revealed in the greatly

dilated sella an encapsuled tumor as large as a pigeon's egg. The chiasm and optic nerves were much thinned and flattened. Under the microscope the tumor proved to be an eosinophile adenoma. This case is confirmatory of the statement of Fischer that the tumor of the hypophysis accompanied by acromegaly is always an adenoma derived from the specific epithelium of the hypophysis, and consists almost wholly of eosinophile cells. Klestadt reported a similar case, in which the adenomatous tumor had extended far beyond the limits of the bed of the hypophysis and had eroded the neighboring bones, something that is very rare in tumors of the hypophysis.

In ULBRICH'S (21, **Sudden onset of bitemporal hemianopsia**) case there was a sudden onset of bitemporal hemianopsia, complete for red, associated with malaise and headache. The patient was 50 years old, had little hair, was of the feminine type, was rather slow, had always lacked libido sexualis, and was very thirsty. The Roentgenogram showed a very marked juga cerebralis and a dilatation of the sella. The diagnosis was fairly certain of a tumor of the hypophysis that had hitherto remained latent, into which a hemorrhage had probably taken place.

PATTON (15, **Ocular symptoms associated with oxycephalus**) reports three cases. In one there was an exophthalmos of 5*mm* to 7*mm* with left convergent squint. There was a low grade of retinal irritation with distension of the vessels and blurring of the disks. In the second case the eyes were markedly proptosed and there was a slight tendency to thickening of the lower lids. Slight retinal disturbances were present, with complete atrophy of the optic nerves and no light perception. The last case had exophthalmos of 7*mm* to 10*mm* with marked divergence in the left eye. Vision was reduced to about $\frac{7}{200}$. There was some disturbance of retinal pigment. Form and color fields were moderately contracted. The patient showed a complete eversion of the right lower lid with thickening of the conjunctiva and two operations were performed to correct the deformity. The other eyelid also was everted to a slight degree. ALLING.

FERNANDEZ (3, **Ocular syphilis in our ophthalmic practice**) made a statistical study of his 1697 cases with various syphilitic manifestations in the eyes and classifies the patients accord-

ing to the seat of the disease, sex, age, time of the appearance of the ocular complications, etc. The percentage of cases with ocular lues was 3.37% in a material of over 50,000 patients seen during a practice of about 39 years. The reviewer's opinion is that since the Wassermann reaction could not have been used in the diagnosis of the largest part of these cases, the reader will have to take the findings of such statistical studies *cum grano salis*.

SCHOENBERG.

POLLAND (16, **Treatment of syphilis with embarin**) has tried embarin in the treatment of syphilis and concludes that it may be considered an advance in the injection of mercury, as it is not inferior to other preparations in efficiency and does not cause pain. The latter is due partly to the solubility of the preparation and the readiness with which it is absorbed, partly to the acoin that forms part of the combination. It may be used in combination with salvarsan.

RAUBITSCHEK (17, **Papillitis in albuminuria**) reports a case in which a papillitis occurred without material involvement of the retina in albuminuria. Such an occurrence is rather uncommon, but this case was also peculiar in that the affection did not appear in the second eye until after it had run an unusually rapid course in the first. A woman, 52 years of age, had suffered for a long time from granular atrophy of the kidneys. A high degree of choked disk was found ophthalmoscopically in the left eye. Three weeks later, after the papillitis in the left eye had already changed into atrophy, a choked disk appeared in the right and ran a similarly rapid course. Fine spots appeared secondarily in the retina, but the case could not be termed one of retinitis albuminurica, while the question of a pseudo-tumor did not arise, because of the absence of all other symptoms indicative of a tumor of the brain, and because such successive onsets of choked disk have never been observed in such a connection. The latter is also contraindicative of the view that the choked disk in this case might be considered a sign of increased intracranial pressure.

For obstinate cases of trigeminal neuralgia, such as those in which resection of the Gasserian ganglion has been performed, HAERTEL (9, **Treatment of trigeminal neuralgia by intracranial injection**) recommends the intracranial injection of 70–80%

chemically pure alcohol, which he has employed in twenty-four cases, with good results in the great majority. After administration of a soporific, a puncture is made under careful aseptic precautions with a ganglion canula 10*cm* long, made of pure nickel. Guided by the finger in the mouth this canula is introduced into the cheek opposite the second upper molar tooth, passed beneath the mucous membrane to the base of the skull and then directed upward. Statements of the patient concerning radiating pains inform us when the needle is correctly placed, and a test injection of novocain shows that the ganglion has been reached by an immediate anæsthesia of the cornea. Alcohol to the amount of 1*cm* is then injected drop by drop. The patient is then confined to the room for ten days with boric acid ointment applied to the eye twice a day, the eye in the meantime being kept bandaged. Later automobile, or ordinary protective, glasses are worn. The author obtained permanent anæsthesia in fourteen of his twenty-four cases, while of the remaining ten, five have had no recurrences, three had severe recurrent attacks at the end of four or five months, which were completely relieved by another injection, and two have had only slight attacks of pain. Among the complications should be mentioned two cases of paresis of the abducens, and particularly the danger of keratitis neuroparalytica caused by the anæsthesia of the cornea, which is to be prevented only by very careful after-treatment. The author himself believes that this method should be employed only when the indications are extremely urgent, but that it should be tried before resorting to resection of the ganglion.

VINSONNEAU (22, **Ocular lesions in epidemic cerebrospinal meningitis**) had the opportunity to observe two cases with eye symptoms in an epidemic of cerebrospinal meningitis. The first patient had an iridochoroiditis that terminated in atrophy of the eyeball. The course of the disease was very violent and could not be influenced therapeutically. Atrophy of the eyeball is the usual result in these cases. The second case had an inflammation of the optic nerve that appeared first as a hyperæmia of the papilla, then became a papillitis, and finally a neuroretinitis that terminated in optic atrophy. No treatment was effective. The prognosis seems to depend on

the stage in which the disease appears, whether the meningeal infection is propagated along the optic tract or not.

CAUSÉ.

BENEDICT (2, **A study of the eye grounds in psychoses**) studied the eye grounds of over one hundred cases of psychoses in the following groups: 1. Psychoses due to organic brain diseases. 2. Imbeciles and epileptics. 3. Dementia præcox. 4. Functional psychoses. Of the thirty-five cases in the first group the fundus was normal in forty per cent. Out of five cases in the second group normal funduses were found in eighty per cent. In fifteen cases of dementia præcox 73.3% showed no abnormality. In the last division, fifty-two cases, one-half were normal. The results in dementia præcox differ from those of Tyson and Clark, who found changes in every one of one hundred and nine cases, varying from congestion of the disk to atrophy, but most of his cases were in the earlier stages of the disease. ALLING.

REICHMANN (18, **Pupillary disturbances in dementia præcox**) found disturbances of the light reaction in the greatest variety of forms, usually with intact reaction to convergence, in almost seventy per cent. of 215 cases. Among these may be mentioned eight cases of katatonic immobility to light, and fourteen of absence of light reaction in pupils influenced by ovarian pressure, the latter differentiating them from hysterical immobility of the pupils. She thinks she has found a fruitful hypothesis for the explanation of the katatonic immobility of the pupils in the probable connection between vasomotor changes and the disturbances in the innervation of the iris.

The first of the two patients reported by VON EIKEN (23, **Retroauricular abscess with choked disk**) had a bilateral choked disk with an extensive retroauricular subperiosteal abscess on the right side, originating from a ruptured, putrefying cholesteatoma. The papillitis was cured by the operation on the abscess and must be considered to be due to a collateral œdema within the skull. In the second case an operation for otitis media and suppuration in the antrum on the right side was followed by a high fever with distinct choked disk. The sinus was then laid bare and found to contain a long thrombus. Recovery followed ligation of the jugular vein.

MAKLAKOW (14, **Ocular manifestations in a unique case of**

telangiectasia of the cerebellum) reports the case of a patient who presented himself with a slight papillœdema and normal field and acuity of vision; later on, a spasm of convergens and a paralysis of the right superior oblique. Adding to these symptoms, nystagmus when looking to the sides, ataxic gait which could be clearly heard with the stethoscope on the left side of the cranium, and a gradual diminution of vision due to the progressing papillitis, the diagnosis of a tumor of the cerebellum was made. The patient died one week after the operation and a telangiectasis of the blood-vessels of the left side of the cerebellum was found.

SCHOENBERG.

III. GENERAL AND EXPERIMENTAL PATHOLOGY AND TREATMENT.

25. ABELSDORFF. **Experimental effects produced on the eye by injections of thorium x.** *Verl. ophthalm. Ges.*, May 21, 1914.

26. ASTRUC, E. **Tincture of iodine in ophthalmology. Tolerance of the cornea and conjunctiva.** *La clinique ophtalm.*, xx., p. 218.

27. BEAUVIEUX. **Treatment of ocular tuberculosis.** *Arch. d'ophtalmologie*, xxxiv., p. 278.

28. BONNEFOY. **Nascent vapor of iodine in ocular therapeutics.** *Annales d'oculistique*, cli., p. 470.

29. CALENDOLI. **Contribution to the experimental transmissibility of leprosy to animals by transplantation of fragments of leprous tissue in the anterior chamber.** *Annali di Ottalm.*, fasc. 5–8, p. 581.

30. DARRIEUX. **Treatment of ocular syphilis with salvarsan and neosalvarsan.** *Annales d'oculistique*, cli., p. 352.

31. DOR. **Treatment of ocular syphilis.** *Ibid.*, p. 381.

32. FRADKINE. **Neosalvarsan in ophthalmic therapeutics.** *La clinique ophtalm.*, xx., pp. 29 and 96.

33. KLAUSNER. **The pallidin reaction in ophthalmology.** *Klin. Monatsbl. f. Augenheilkunde*, June, p. 813.

34. KRAUPA. **Bacterial prophylaxis of operative infection.** *Ibid.*, March–April, p. 375.

35. LASAREW. **The local use of guaiacol in tuberculous diseases of the eye.** *Zeitschrift f. Augenheilkunde*, April–May, p. 456.

36. RAUCH. **The influence of embarin in syphilitic affections of the eye.** *Archiv f. Ophthalmologie*, lxxxviii., p. 184.

37. SCHANZ, FRITZ. **The basis of light treatment of diseases of the eye.** *Ophthalmology*, April, 1914.

38. STEINDORF. **Experimental studies of the effect of eel serum upon the human and the animal eye.** *Archiv f. Ophthalmologie*, lxxxviii., p. 158.

39. TRUBIN. **Intraocular anaphylaxis.** *Zeitschr. f. Augenheilk.*, p. 446.

40. UHLENHUTH and MULZER. **Atlas of rabbit syphilis.** J. Springer, Berlin.

41. ZADE and BARÇZINSKI. **Sophol.** *Deutsche med. Wochenschr.*, p. 647.

42. ZIELER. **Salvarsan and ocular troubles.** *Muenchener med. Wochenschr.*, No. 26, p. 1481.

PATHOLOGY.

KRAUPA (34, **Bacterial prophylaxis of operative infection**) saw twenty-two cases of post-operative iritis after 635 operations for cataract during the years 1910–1912, half of which were not of mycotic origin. Among these abacterial cases of iritis he reckons those in which no germs could be found in the anterior chamber a short time after the onset of the inflammation, or no pathogenic bacteria were demonstrable at any time in the conjunctival sac.

TRUBIN (39, **Intraocular anaphylaxis**) finds that a single injection of foreign vitreous into the vitreous space of a rabbit produces only minimal signs of irritation which never recur; cord-like or cloud-like opacities are formed in the vitreous, but no changes take place in the fundus. But if the same injection is made in an animal that has been sensitized by an intravenous injection of the same kind of vitreous in large doses three or four weeks before the local injection, the signs of inflammation in the vitreous are more distinct, are very apt to recur, and are followed by such changes in the fundus as atrophic patches, proliferation of pigment, infiltration of the iris and ciliary body, exudates in the pupil, infiltration of the choroid, perineuritis and perivasculitis of the central vessels of the optic nerve.

STEINDORFF (38, **Effect of eel serum on the eye**) describes the clinical picture of conjunctivitis ichthyotoxica. He finds by experiments on rabbits that a complete congenital insensitiveness to the conjunctival instillation of eel blood serum occurs, and it is possible to obtain a transient local immunity by several instillations. But care must be exercised in judging the results of the experiments, because the toxicity of the serums of different eels is not the same, and they do not equally destroy the blood corpuscles. He confirms the statements of former authors that heating the serum to 56° for thirty minutes destroys the properties of the serum which excite inflammation

and hæmolysis. The same result is obtained by irradiating the serum with ultra-violet light for forty-five minutes with Kromayer's quartz lamp. The immunization by instillation is purely local, and even that produced by subconjunctival injection does not extend to the other eye. By intravenous injection a very intense miosis is produced which is greater than that induced by alkaloids and does not yield to atropine, but this does not occur in immunized animals, when immune serum is injected at the same time, or when the serum has previously been treated with ultra-violet light. The cause of the miosis is unknown.

A piece of the cornea of a leper was introduced into the anterior chamber of a rabbit by CALENDOLI (29, **Experimental transmissibility of leprosy to animals**). The small mass increased in size until it reached the size of a hemp seed in four months, and then decreased. The animal was killed six months after the implantation. Microscopic examination showed a very large number of leprosy bacilli, not only in the implanted piece, but also in the anterior chamber and all the tissues adjacent to it, which exhibited a granular infiltration. The reproduction of leprosy bacilli in the eye of the rabbit by implantation of fresh fragments taken from lepers into the anterior chamber may be regarded as settled.

CALDERARO.

UHLENHUTH and MULZER (40, **Atlas of rabbit syphilis**) demonstrate that with a suitable technic of infection the rabbit is very susceptible to syphilis, contrary to former views, and that the forms exhibited resemble in many respects the syphilitic symptoms in man. The virus is introduced into the anterior chamber, and, unless suppuration occurs, the eye becomes perfectly quiet in from five to ten days. After a period of incubation that varies in length, a pericorneal injection and often an iritic irritation appear, followed by an opacity at the point of puncture. A keratitis develops, accompanied by a superficial vascularization, until the entire cornea is opaque and thick, in which condition it frequently remains for months. Spirochætæ can be found both in the pannus and in the deeper layers. A large number of pictures portray the conditions found.

KLAUSNER (33, **The pallidin reaction in ophthalmology**) has

made 2000 cutaneous inoculations with pallidin to test its value in the diagnosis of syphilis. The preparation is made from lungs of syphilitic fetuses that contain spirochætæ, which are finely triturated, floated in slightly alkaline water, gently centrifuged, the cloudy top fluid containing spirochætæ is poured off, sterilized in a water bath for an hour at 60°, and mixed with ½% of carbolic acid. None of the 1600 control cases gave a positive reaction. Syphilis in the first and second stages and latent syphilis proved refractory, and positive reactions were secured only in gummatous and late hereditary syphilis. In these cases an inflammatory infiltrate was formed, which was often slightly papular and had an areola of erythema. All the symptoms started to retrograde on the third day. In a negative reaction there is only a moderate irritation of the vicinity that always disappears completely within forty-eight hours. The test was made together with Wassermann's in 100 cases of eye diseases in which syphilis was suspected; sixteen gave a positive Wassermann, twenty positive pallidin. In twenty cases of interstitial keratitis both reactions were positive in four, while in eight the pallidin was positive, the Wassermann negative. Three of these cases had had positive Wassermann previously, the fourth was clinically certain to be late hereditary syphilis, and in a fifth the Wassermann became positive later.

SCHANZ (37, **The basis of light treatment of diseases of the eye**) shows that the cornea absorbs light rays of short length, beginning with those of 360*mm*, and completely absorbs those of 300*mm*. The lens absorbs in the blue rays, and more completely in the ultra-violet. He also demonstrates the phenomenon of fluorescence in the lens and retina. He thinks that cataracts are the result of exposure of the eye through life to the short-ray end of the spectrum, and recommends euphos glass to cut off the invisible rays. On account of its stimulating effect he suggests the employment of light of short wave length in the treatment of corneal affections, using proper precautions in order to avoid the dangers incident to the exposure. ALLING.

Our knowledge concerning the action of radioactive substances on the normal eye has depended on experiments in which the rays enter the eye from in front, and the different

parts of the eye were necessarily affected very unequally by them. To lessen this inequality and so obtain a more accurate idea of their effects, ABELSDORFF (25, **Experimental effects produced in eyes by injections of thorium** x) has introduced a solution of thorium x into the eye itself. This injection into the anterior chamber of rabbits produced a decolorization of the iris, which in sufficient doses increased to complete atrophy. Larger doses were accompanied by a parenchymatous keratitis, the formation of ulcers on the cornea, and severe conjunctivitis. Injections into the vitreous brought about great changes in the retinal vessels, hemorrhages and exudates, which finally resulted in the picture of a chorioretinitis that has run its course with partial atrophy of the optic nerve. The iris became decolorized; the lens remained transparent.

ADAM.

TREATMENT.

ZADE and BARCZINSKI (41, **Sophol**) call attention to the fact that the literature recommending sophol as bactericide to gonococci is based wholly on clinical material, and almost no test-tube experiments have been reported, so they undertook to supply this lack, which is rather important in view of the very fluctuating severity of different cases of the disease. Unfortunately they obtained very uneven results.

ASTRUC (26, **Tincture of iodine in ophthalmology**) observed three cases in which tincture of iodine was instilled into the eye by mistake for argyrol or protargol. Two were children with blennorrhea, the other an old woman with ulcer of the cornea and suppuration of the lacrimal sac. After the signs of a quite sharp irritation had passed away no injury was to be perceived of the cornea or conjunctiva, while the infectious process ran a strikingly better course. He concludes that the tolerance of the cornea and conjunctiva to iodine and alcohol must be greater than has been thought. CAUSÉ.

BONNEFOY (28, **Nascent vapor of iodine in ocular therapeutics**) produced iodine vapor by heating iodoform. It produces a lively pain in the eye, œdema of the conjunctiva, congestion of the margins of the lids, and affects the secretions of the glands of the lids and of the lacrimal sac. It may be

used in chronic disease of the lacrimal sac, affections of the lids, ulcers of the cornea, and trachomatous pannus.

CAUSÉ.

BEAUVIEUX (27, **Treatment of ocular tuberculosis**) says that tuberculin treatment gives particularly good results in weakened tuberculosis, which is usually caused by the tuberculous toxin circulating in the organism. Iritis, with or without tubercles, iridocyclitis, keratitis, and serous or disseminated choroiditis are doubtless improved by its use. But no benefit can be obtained from it in inflammatory granuloma in children, it is more apt to do harm. Enucleation in such cases is the only means to prevent dissemination of the bacilli. Experience also shows, unfortunately, that a person who has had tuberculin treatment cannot be regarded as immune. Serum treatment must be supported by a strengthening general treatment. CAUSÉ.

LASEREW (35, **Local use of guaiacol in tuberculous diseases of the eye**) reports good results in nine cases. 1. Three cases of tuberculous conjunctivitis completely cured by guaiacol ointment applied locally. All three patients young, Pirquet positive, tuberculosis positive, diagnosed microscopically. 2. One case of caries of the orbit with fistula in a girl 7 years old, Pirquet positive, Wassermann negative, cured in four weeks by curetting and injection of a 1% solution of guaiacol. 3. Three cases of interstitial keratitis; Pirquet positive, Wassermann negative. Marked improvement from the subconjunctival injection of a 1% solution of guaiacol in a comparatively short time. 4. Two cases of uveitis regarded as tuberculous. Rapid improvement. In the discussion Auerbach and Golowin pointed out that the diagnosis of tuberculosis was not sufficiently established by Pirquet's test.

After a historical review of the treatment of syphilis DOR (31, **Treatment of ocular syphilis**) turns to arsenical medication inaugurated by Schaudinn's discovery, and goes deeply into treatment with salvarsan. The enthusiasm that welcomed a therapia sterilizans magna was soon dampened by evidence that the initial dose of salvarsan did not guard against the appearance of the secondary symptoms. Time has shown that this remedy, thanks to the discovery of neosalvarsan and the simplification of its administration, is very efficient, especially

in acute syphilitic affections of the eye. Abortive treatment with salvarsan is indicated in chancre of the lids and conjunctiva, as well as in ulcers and gummata of the cornea and conjunctiva. Its action is uncertain in interstitial keratitis. Iritides, inflammations, and gummata of the ciliary body are to be treated with salvarsan to the limit of tolerance. In syphilitic cataract he recommends treatment with iodides, in vitreous opacities subconjunctival injections and sweating. In specific choroiditis mixed treatment, together with energetic local, is usually successful. The therapeutic influence to be obtained over tabetic ophthalmoplegias and diseases of the optic nerve is quite uncertain, but at least a temporary improvement may be obtained by mixed treatment. Salvarsan has brought no improvement to the treatment of diseases of the eye dependent on hereditary syphilis, especially interstitial keratitis. The energy of the treatment must generally be proportional to the severity and localization of the disease, and so the treatment may be divided into three grades: mild, consisting of intramuscular injections; strong, intravenous injections of soluble salts; and rapid, giving first mercury, then salvarsan, and then iodides. When a nephritis is present at the same time it should never be forgotten that this may be of specific origin. Tuberculosis and syphilis coincide, especially in children with interstitial keratitis, where in addition to the mercurial treatment a general treatment for tuberculosis is indicated. Salvarsan and mercury should be given simultaneously in cases of malignant syphilis. Salvarsan is a valuable remedy, but is not sufficient for all forms of syphilis in the eye. Perhaps Noguchi's luetin signifies a new era in the treatment of syphilis by syphilization.

In the discussion Antonelli and Lagrange were less favorable to salvarsan. Antonelli prefers the iodides in gummatous processes, mercury in iritic changes. He has observed nervous complications after the use of salvarsan, which did not always quite recover. The most important thing in the treatment of interstitial keratitis in addition to the local, is a strengthening diet, perhaps with a careful administration of mercury. Terson uses salvarsan when he wishes a particularly rapid effect, but otherwise prefers internal treatment and careful inunctions in children. He has instilled enesol with good results.

Darier treats the secondary and tertiary, as well as the parasyphilitic manifestations with salvarsan under the guidance of the Wassermann reaction. Rochon-Duvigneaud has had excellent results from neosalvarsan, which he thinks surer and quicker than mercury. CAUSÉ.

Neosalvarsan is the remedy of choice in the treatment of syphilis of the eye in any stage, according to FRADKINE (32, **Neosalvarsan in ophthalmic therapeutics**). A combination with mercury and iodide should be tried only after it has failed. He maintains that there is not a single case, to which objection cannot be taken, of neurotropic effect upon the optic nerve, and that all eye affections that appear after its use occur in spite of the treatment and not as a toxic effect of the neosalvarsan. A progressive sterilization can be reached by a long continuance of sufficient doses, and recurrences are due to faulty dosage, or too early an interruption of the treatment. Gradually increasing doses up to 1*ctg* per kilo have a better sterilizing effect than large single doses. The immediate and late evil results are due to various causes, such as anaphylaxis, Herxheimer's reaction, or a previously latent pathological condition. He has seen no cures from intramuscular and subconjunctival injections, they must always be intravenous.

CAUSÉ.

DARRIEUX (30, **Treatment of ocular syphilis with salvarsan and neosalvarsan**) reports his observations in about two hundred cases. He has seen bad accidents more often after the intravenous injection of salvarsan than after the use of neosalvarsan, but they were not dangerous in any. Salvarsan has the best effect upon the uveal diseases from a histological standpoint, on changes in the anterior segment from the anatomical, and in acute disease in the course of a fresh syphilis from a clinical. It produces improvement in only about half the cases of chronic iritis, and its effect is uncertain in choroiditis. A good effect had not been noticed on the corneal process in interstitial keratitis, but had been seen on the accompanying uveal symptoms. Retinal changes and tabetic symptoms on the part of the optic nerve or the extrinsic muscles were not influenced, while improvement had been obtained in syphilitic diseases of the nervous elements of the eye that were not of tabetic genesis. The mercurial treatment runs parallel to that

with salvarsan, and the latter is to be preferred only in acute diseases; the hoped for sterilization of the organism has not been attained. CAUSÉ.

ZIELER (42, **Salvarsan and ocular troubles**) showed two patients that had been treated with iodide of potassium and salvarsan for syphilis or syphilitic tabes. They presented paresis of the oculomotorius and punctate hemorrhages in the region of the macula. It must always be borne in mind that in conjunction with vascular troubles salvarsan may favor the occurrence of hemorrhages, and that under such circumstances more than usual care must be exercised in the use of salvarsan. Such hemorrhages may easily escape observation as they are slight and excite subjective symptoms only when the macula itself is affected, as was the case in one of these patients.

RAUCH (36, **The influence of embarin in syphilitic affections of the eye**) finds that embarin is absorbed rapidly, does not usually cause a rise of temperature, and is painless. The lumps that occasionally appear in the muscles after intragluteal injection do not go on to abscess. He advises a slow treatment with small doses and a very strict care of the mouth.

IV.—METHODS OF RESEARCH, REMEDIES, INSTRUMENTS, AND GENERAL OPERATIVE TECHNIC.

43. BROCA, A., JOUAUST, DE LA GORCE, and LAPORTE. **Study of the new electric luminescent lamps and the action of extreme red and ultra-violet rays on the visual organ.** *An. d'Ocul.*, vol. cli., No. 4, p. 273.

44. SERGIEWSKY, L. **A new tonometer.** *Zeitschr. f. Augenh.*, April-May, p. 449.

BROCA, JOUAUST, DE LA GORCE, and LAPORTE (43, **Study of the new electric luminescent lamps and the action of extreme red and ultra-violet rays on the visual organ**) conclude that the mercury lamp is not inferior, from the hygienic point of view, to other sources of light. They insist that the bulb must be enclosed in a certain globe without which the light is too intense and causes at least irritation of the conjunctiva. The intensity of the so-called "Neon Lamp" could not be accurately measured; however, a point worthy to be mentioned is, that the visual acuity is higher in this than in any other light. The eyes seem to become less fatigued in the Neon light, a fact which is also peculiar to the mercury quartz lamps. Gener-

ally speaking, the monochromatic lights are more trying to the retina than the complex colored lights, a fact which is in agreement with what is known about the retinal sensibility.

SCHOENBERG.

SERGIEWSKY'S (44, **A new tonometer**) instrument consists of a glass prism with three concentric circles inscribed on its lower surface. When this prism is laid on the cornea the latter will be flattened and touch one, two, or three rings according to the condition of the tension. If the three rings are touched, the tension may be assumed to be normal; the lesser degrees of impression correspond to higher degrees of tension. The instrument is particularly useful for a rapid, approximate measurement of tension.

V.—ANATOMY, EMBRYOLOGY, MALFORMATIONS.

45. BEAUVIEUX. **Epithelial serous cysts of the iris.** *Arch. d'ophtalm.*, xxxiv., p. 193.

46. BERG, FREDERIK. **Unusually extensive medullated nerve fibers with high myopia and amblyopia.** *Klin. Monatsbl. f. Augenheilk.*, lii., p. 495.

47. BERGMEISTER, R. **Pigment anomaly of the iris.** *Ibid.*, p. 723.

48. BOEHM. **Congenital anterior and posterior synechiæ of the iris, with hydrophthalmos.** *Ibid.*, June, p. 841.

49. CALHOUN, F. P. **Bilateral coloboma of the lens.** *Ophthalmology*, April, 1914.

50. GAMBLE, W. E. **Albinism of the eyes without involvement of the hair or skin.** *Ophthalmic Record*, May, 1914.

51. LUNA. **Chondrisomes and retinal pigment.** *Arch. f. Zellforschung*, 1913, x., 3.

52. MATTAUSCHEK, EMIL. **Peculiar changes in the medullary sheaths of degenerated nerve fibers.** *Neurolog. Centralbl.*, 1914, No. 7, p. 403.

53. ROTH, H. and M. **Contributions to the pathology and pathogenesis of congenital coloboma of the eyeball.** *Arch. f. vergl. Ophthalm.*, ii., p. 129.

54. SAMUELS, BERNHARD. **Ectropium uveæ congenitum.** *Zeitschrift f. Augenheilkunde*, xxxi., p. 333.

55. TERRIEN. **Congenital cataract and remains of the pupillary membrane.** *Arch. d'ophtalm.*, xxxiv., p. 230.

56. WHITNALL. **The levator palpebræ superioris muscle. The attachments and relations of its aponeurosis.** *The Ophthalmoscope*, May, 1914, p. 258.

MATTAUSCHEK (52, **Peculiar changes in the medullary sheaths of degenerated nerve fibers**) found a very marked network on the nerve fibers in the neighborhood of a tumor of the

fourth ventricle. The nerve fibers were swollen and presented spherical elevations with a conspicuous network of the medullary sheaths. The Weigert hæmatoxylin stain was used.

CALHOUN'S (49, **Bilateral coloboma of the lens**) first patient was a man of 61 having iridodonesis, mature cataracts, and defective projection. No abnormality of the lenses was noticed, but after the extraction he thought that he could determine a decided deficiency in the lower segment of each lens. The illustrations showing the lenses are not convincing. Another case showed four punched out places at the border of the right lens downwards and inwards, and an apparent marginal defect in the same position in the other eye. The third case had congenital coloboma of the iris and choroid, and a small amount of lens missing in the lower quadrant.

ALLING.

BEAUVIEUX (45, **Epithelial serous cysts of the iris**) observed a congenital serous cyst with an epithelial lining in a child 28 months old. The cyst was as large as a pinhead, situated on the anterior surface of the iris, and had been noticed by the parents immediately after birth. A malformation of the lower jaw consisted in the presence of the two middle incisor teeth. The cyst was removed and found histologically to belong to the rare epithelial variety. Trauma is excluded as the cause, and, together with the anomaly of the teeth, it is rather to be considered as a fetal fault of development. Perhaps it originated through a fault in the closure of the ocular cleft, in which some ectodermal cells became separated and developed later. The situation of most cysts, on the inner-lower part of the iris, favors this idea. In many cases the wall of the cyst has relations to the retinal portion of the iris, and then it may be supposed that we are dealing with remains of the sinus annularis. He inclines to Nadal's theory that toward the end of the first month of pregnancy certain cells of the ectodermal cell colonies that go to the formation of the lens become implanted on the anterior surface of the secondary optic vesicle and that then some later acting cause occasionally leads to the formation of a cyst.

CAUSÉ.

BERG (46, **Unusually extensive medullated nerve fibers with high myopia and amblyopia**) found in a boy 10 years old a deep funnel-like excavation at the place of the papilla, about which

were medullated nerve fibers some of which covered the region of the macula.

BERGMEISTER (47, **Pigment anomaly of the iris**) found in a girl 8 years old a melanotic zone in the inner-upper quadrant of the iris that resembled an atypical coloboma. He took it to be an ectropium uveæ congenitum.

BOEHM (48, **Congenital anterior and posterior synechiæ with hydrophthalmos**) examined histologically several eyes with troubles of this nature. In one there were signs of a fetal inflammation, during which he thinks that the iris was pressed forward and became adherent to the cornea. In two other cases he leaves the question open whether the synechiæ, anterior and posterior, should be referred to an inhibition of development and faulty separation, or to a secondary adhesion, but he is inclined to believe them to be due to fetal inflammation.

GAMBLE (50, **Albinism of the eyes without involvement of the hair or skin**) saw a child with nystagmus and albinotic eyes. There was, however, a slight amount of pigment in the irides. Pigment was otherwise normally present in the body. The vision was defective. ALLING.

H. and M. ROTH (53, **Congenital coloboma of the eyeball**) describe a case of coloboma of the iris, ciliary body, choroid, and intraocular end of the optic nerve, met with in a child 8 weeks old. A mesodermal ledge was demonstrable in the coloboma. The central vessels were lacking in the optic nerve; the fovea was normally formed; the sphincter was developed at an atypical place, apart from the iris; the retina presented duplicatures. Another case was one of coloboma of the iris, ciliary body, choroid, and intraocular end of the optic nerve in an adult. A third case was one of coloboma of the iris, choroid, and intraocular end of the optic nerve in an infant. The authors incline to think that the vascular mesodermal ledge, which was present in the coloboma in all three cases, forms a considerable interference with the closure of the optic cleft. No indications were found of a lessened tendency to grow on the part of the margins of the secondary optic vesicle.

TERRIEN (55, **Congenital cataract and remains of the pupillary membrane**) reports two observations that show a connection between congenital cataract and remains of the pupillary

membrane. The first case presented an irregularly stellate anterior polar cataract, not pyramidal and not prominent, in the center of which pupillary threads were inserted that came from the minor circle of the iris. Such a cataract was present in each eye. Central delicate maculæ were to be found in the cornea, and in the region of an artificial coloboma of the iris there were traces of pigment upon the anterior capsule. The patient had had a severe purulent inflammation of both eyes after birth. In the second case both eyes had a punctate congenital cataract without ophthalmoscopic changes, complicated by the simultaneous presence of remains of the pupillary membrane and pigment spots on the anterior capsule of the lens. Perhaps both the cataract and the persistent pupillary membrane have the same etiology and are to be ascribed to a fetal inflammation. CAUSÉ.

SAMUELS (54, **Ectropium uveæ congenitum**) describes a case of this nature clinically and histologically. He regards the ectropium as a malformation and places the period of its origin in the third embryonal month. Twenty-four cases are collated from literature.

LUNA (51, **Chondrisomes and retinal pigment**) comes to the conclusion, from his studies of the embryos in various eggs, that the chondrisomes of the pigment epithelium of the retina are changed completely into pigment granules.

CALDERARO.

WHITNALL (56, **The levator palpebræ superioris muscle**) presents a careful study of the palpebral attachments of this muscle. In dissection of the eyelids, layer by layer, from the front, the usual description is that after the removal of the skin and orbicularis muscle, the tarsal plate is exposed. Whitnall points out that beneath the orbicularis muscle is a further layer of connective tissue which must be removed before the plate is exposed. This layer is continuous with the aponeurosis and is met by the septum orbitale. When reflected it exposes the tarsal plate and Müller's muscle. He also directs special attention to the relations, medial and lateral extensions, of the aponeurosis of the levator muscle. The lateral extension is anchored strongly into the margins of the orbit, and by ligamentous bands firmly attached to the lacrimal gland; it is continued over to be fixed into a tubercle of the malar bone

just within the orbital margin opposite the outer canthus. It thus holds the lacrimal band in position and is capable of moving it. Sometimes there are lateral outshoots of the belly of the muscle itself into the gland. On the medial side the aponeurosis loses its tendinous nature and is traced with difficulty towards the medial palpebral ligament, and herewith the orbit and the tendon of the superior oblique above demark a triangular space through which orbital fat bulges (*bourrelet senile*) when, as in age, the orbicularis oculi loses its tone. CURRAN.

VI.—NUTRITION AND INTRAOCULAR TENSION.

57. HERTEL, E. **Experimental investigations on interdependence of ocular pressure and blood constituents.** *Arch. f. Ophth.*, lxxxviii., 2, p. 197.

58. HOROWITZ. **The relations between fluctuations of the eye tension and of the blood pressure in man.** *Physikalisch-medizin Gesellschaft in Wuerzburg*, June 25, 1914.

59. LAGRANGE, F. **On a method of raising the ocular tension.** *Arch. d'opht.*, vol. xxxiv., No. 6, p. 337.

HOROWITZ (58, **Relations between the fluctuations of the eye tension and of the blood pressure**) instituted a number of investigations that demonstrate very close connections between the blood pressure and the intraocular tension.

HERTEL (57, **Experimental investigations on interdependence of ocular pressure and blood constituents**) has tried to determine the influence of the composition of the blood on the intraocular pressure independent of the blood pressure. He has injected solutions of crystalline and colloidal substances into the blood of rabbits and has measured the intraocular pressure with Schiotz's tonometer in regular intervals. For the experiments with salts he has used mostly sodium chloride in solutions from 0.45–10%, sodium sulphate, phosphate, bicarbonate, acetate in similar concentrations, furthermore grape-sugar in 20–40% solutions, urea, gelatine, serum, egg albumen, etc.

The experiments showed that concentrations of the introduced saline solutions down to 0.017% of sodium chloride or isosmotic concentrations of the other substances lowered the intraocular pressure. The diminution as a rule began after five minutes and continued until the pressure was nil. Con-

centrations lower than those mentioned and distilled water increase the eye pressure. The experiments with sugar, urea, and the colloidal substances led to similar results. A change in the blood pressure was not responsible for these changes in the eye-tonus. The intravenous infusions influenced the blood pressure very little. Additional injections of adrenalin, which raised the blood pressure much, did not raise the lowered eye pressure. The changes found were due to the increased or lowered concentration of the blood. When the blood is highly concentrated, it will try to dilute itself down to the normal concentration by attracting fluid from the tissues. When the blood-concentration is lowered, it again will try to reach its normal standard by expressing fluid into the surrounding tissues. Low concentrations of the injected fluid increase the intraocular pressure. SCHIRMER.

LAGRANGE (59, **On a method of raising the ocular tension**) says that a subnormal intraocular pressure is detrimental to the proper nutrition of the organ and for this reason he recommends the superficial cauterization of the sclera all around the limbus in cases of detachment of the retina accompanied by a low intraocular pressure. He thinks that the use of the cautery results in the formation of a ring of connective tissue which compresses the eyeball and raises its tension. He reports two cases with glaucomatous manifestations on account of the thickening of the sclera following the excision of an epibulbar epithelioma in one case, and an accidental severe lime burn of the eyeball in the second case. These two histories tend to show—according to the author—that a thickening of the sclera may raise the ocular tension. He practised his operation, which he calls "Blindage de l'œil," in six patients with retinal detachment and invariably obtained a temporary increase of ocular tension, which, in the majority of cases, exceeded the normal limit. One case was a complete success: the retina became reattached.

SCHOENBERG.

(To be continued.)

CORRESPONDENCE.

Sept. 3, 1914.

Editor, ARCHIVES OF OPHTHALMOLOGY:

You were kind enough to publish in your journal, Volume XLI., No. 6, of 1912, "A Simplified Gram Technique." I have since found that many have tried this technique and did not get the results as stated. My own original bottle of the stain being exhausted, I procured some of the Methylviolet 6B, but found to my surprise that I was unable to duplicate the results during the experiments which led to the writing of the paper. I then procured another bottle, fresh from Grueb-ler, and was again unable to get the stain as it should be.

During a recent visit to London I asked Dr. Angus McNab, the translator of Axenfeld's "Bacteriology of the Eye," what the probable reason for this difference was, and he replied that he had had exactly the same experience,—that he had made up a stain with which he got the most ideal results, and much along the line of my technique, but after the original bottle of the powder was used he was unable to duplicate the solution, and he further stated that bacteriologists in Axenfeld's clinic have found that practically all these stains varied considerably in different bottles.

I feel therefore that it is only fair to myself and your readers to state that I have been unable to make a solution which will do what my original one did, and on which I based the article. However I am experimenting with some modifications and trust to be able to work out a solution with which this can be done at any time. Thanking you for printing this, I am,

Yours very truly,

WALTER H. SNYDER.